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ORIGINAL COMMUNICATIONS.

A STUDY OF THE INDUCTION AND AUGMENTATION OF LABOR PAINS.*

BY

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Up to comparatively recent times little advancement has been made in obstetrics. Outside of the use of forceps, no improvement worthy of note was made until the practice of asepsis came in vogue, and later when the application of the principles of surgery were added to this art. Now the sciences of physiology, pathology, and experimental biology bid fair to give us a more perfect control of this practice which up to very recent times was considered beyond regulation.

In this day of increased accuracy in the practice of obstetrics we look forward to the time when we shall guide the pregnant woman safely through confinement, and further by the application of knowledge of the physiology of labor pains, we will be able to control the time and forces of labor when necessary to do so. One can readily appreciate the value of knowing the source of the onset of labor contractions, and the cause of their natural augmentation.

For ages the view of Hippocrates held that during the last part of pregnancy the unborn child was forced by hunger to place his feet against the fundus and so force his way out of the uterine cavity to gain the required nourishment. Galen was the first to deny the fetal movements to be the cause of labor, and assigned the action to the contractions of the uterus which gradually dilated the cervix, and then forced the fetus out of the uterus with the aid of the abdominal muscles. Since then we have heard of a number of theories as to the cause of the onset of labor. Among others were the overdistention of the uterus, the lack of oxygen, oversupply of carbon dioxide, irritability of the uterus, maturity of the ovum, periodicity and heredity. Some of these play accessory rôles in the production of the onset of labor contractions, but none of these is the essential cause.

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* Read before the Wayne County Medical Society, April 7, 1913.

Finally the case of the Bohemian sisters was described and discussed by Schauta(1) and Basch(2) in 1910. One of these twins whose bodies were united, became pregnant, and during pregnancy the other developed the various phenomena characteristic of pregnancy. This led Sauerbruch and N. der Heyde(3) to conduct a series of experiments on artificially united rats, one of which was pregnant. When the union was made a few days before parturition both animals remained normal until a few hours before labor. Then the nonpregnant animal, male or female, became very sick, its weakness increasing until it could not move. The pupils became small, hair bristly, copious discharges of bowels and urine occurred; appetite was completely lost, also reflex action. Usually to the state of exhaustion were added twitchings and contractions, and finally convulsions which led to death of the animal during or just after the parturition of the other animal. Those which recovered gradually regained health in a few days. When union had been made fourteen days or longer before parturition, the symptoms of toxemia in the nonpregnant animal were less severe, depending upon the length of time of union. Both Sauerbruch and Heyde considered these symptoms of an intoxication resulting from substances circulating in the parturient animal which is not harmed by the toxin. Animals united a longer time were symptomless because of an acquired immunity.

In a second series five parabiotic unions were made, each between two female animals, one of which was near the end of pregnancy, the other in the beginning. They all passed normally the time up to the parturition of the older pregnancy. In two cases the younger pregnancy was uninfluenced, and proceeded to term; in the other three abortions occurred synchronously with the birth in the older pregnancy. The authors considered the substance producing contractions as specific. The reason given for the two failing to abort was lessened uterine susceptibility.

Von der Heide(4) at the request of Prof. Henkell attempted analogous experiments on women, using defibrinated blood taken from parturient women during the first or second stages of labor.

Eight to twenty cubic centimeters were injected in three cases without any change. In the fourth case immediately following the injection there appeared restlessness, dyspnea, cyanosis, sweating, and the pulse rose from eighty to 140 per minute. In ten miutes the patient recovered her normal state.

As the result of a series of experiments by Lockemann and Thies(5) on gravid rabbits, in which fetal serum had been injected, Heide decided to try the same course on women. If the effect of human fetal serum on pregnant human female is analogous to that of the lower animal, it is to be expected that uterine contractions will result from the injection.

Heide injected fetal serum intravenously in twenty-six gravid women, using various quantities and in certain cases repeated the injections. These he has divided into six groups. The first consisted of four women at or near term who reacted to serum at once and labor proceeded from the time of injection to delivery without interruption. Before the injection they had felt no pains and examination indicated that labor had not begun. Two of these reacted with a rise of temperature to 39° C. which returned to normal during labor without injury to the patient. Case one showed no change three-fourths of an hour after injection from what was present four days before by vaginal examination.

The next group consisted of three women who were injected before term, and reacted with cyanosis, pulse and temperature increases. Pains were transient and did not lead to birth.

Group three consisted of six parturient women who suffered early in the first stage of labor from uterine inertia. Each of these had increasingly efficient contractions shortly after the injection which led to the termination of labor.

Group four included eight cases which were influenced by two or three injections. One gave birth to a 47 cm. 2,400 gm. child sixteen days after a second injection, indicating that the serum had produced labor before term.

Group five consisted of one case in which serum was injected ante- and postpartum, also ovarian extract, after which she reacted with fever, headache and hematuria.

Group six included four women who were given repeatedly increasing injection intramuscularly. Labor occurred normally a few days after these. The last case was one in which injections were given at five and one-half months for hyperemesis, the result was birth at seven months of a living child.

Von der Weide is certain that fetal serum is capable of inducing labor when injected intraveneously or intramuscularly. He concludes, "according to my view labor is an anaphylactic process; human fetal serum acts as foreign proteid does. Fetal serum produces contractions of the uterus in both primary and secondary inertia. The experimental production of eclampsia in women apparently lies in the same line."

Rongy(6) followed these experiments with a series of nineteen cases in which he used fetal serum intravenously. Twelve reacted and birth followed, seven resulted negatively. Of the twelve positive cases some were premature and some were cases of inertia which was overcome.

I injected 10 c.c. of fetal serum in each of two women who were not pregnant without causing any objective symptoms. One was a nullipara, the other one had one child. Each was injected shortly before menstruation which came on normally at the usual time.

I have injected fetal serum intraveneously in the buttocks of six pregnant women near term.

CASE I.—Edith. Primipara, confinement due April 2, 1912; 20 c.c. fetal serum injected in buttocks May 3, at 4.45 P. M. At 10 P. M. contractions began, continuing for one-half minute at twenty-minute intervals. At midnight, temperature rose to 99° F. At 2 A. M., May 4, pains every fifteen minutes; external os dilated 1 cm., cervix thinned out; 4 A. M., pains severe at ten-minute intervals lasting almost one minute. Temperature 99.2; 6 A. M., pains every three minutes, very severe; 7 A. M., head bulging on perineum; 8.45 A. M., female child born 50 cm. long, 3,200 gm. weight.

CASE II.—Casmere, Providence Hospital, primipara, confinement due May 22; 11 A. M., 28 c.c. fetal serum injected in buttocks. Examination showed head engaged in pelvis but cervical canal closed. At 4 P. M., temperature rose to 100° F., pulse 74, respiration 20. At 7 P. M., temperature 100° F., pulse 80, respiration 24, no cyanosis or difficult respiration 90. May 23, 2 A. M., pulse 72, temperature 98.2, respiration 20. Labor pains began 10 A. M.; blood pressure 135; 12 noon, pains every ten minutes, external os 2 cm. dilated cervix thinned out; pulse 86, temperature 98.8, respiration 28, blood pressure 140. 2 P. M., pains at five-minute intervals; blood pressure 133. 5 P. M., pains three minutes apart. 5.20 P. M., membranes ruptured. 6 P. M., dilation 5 cm. 6.50 P. M., male child born weight 3,400 gm., length 50 cm.

CASE III.—Tillie, primipara, Providence Hospital. Labor due May 25, 1912. Twenty-five cubic centimeters serum injected in buttocks at 11 A. M. Examination showed head engaged; cervical canal closed. There was no reaction, pulse remaining normal, temperature normal or subnormal, respiration 18–20, blood pressure constant 120, no contractions. May 30, 1912, female child born after short easy labor, weight 3,300 gm., length 50 cm.

CASE IV.—Mary, primipara, Providence Hospital. Labor due July 7, 1912. June 13, at 11 A. M., 18 c.c. serum injected. Examination showed fetus unengaged, no cervical dilation. No reaction shown by pulse, respiration or temperature. June 21, premature male child born after easy labor, weight 2,800 gm. length 49 cm. Lanugo on chest and shoulders, red skin.

CASE V.—Mrs. C. W., due Sept. 1, 1912; albumin 0.1 per cent; epigastric disturbances, headaches, nausea, visual disturbances; blood pressure 150. July 19, 27 c.c. fetal serum injected in buttocks at 4 P. M. Patient was multipara with long lateral cervical lacerations. No evidence of labor at time of injection. Slight pains through the night at half-hour intervals. July 20, pains more frequent though weak. 9 A. M., interval os was dilated to 3 cm., during day pains gradually lessened. At 10 P. M. began to get stronger at one-fourth-hour intervals and increased to five-minute intervals by 9 A. M., July 21. At this time there was no engagement, dilatation about 7 cm. and membranes bulging through cervix. Because increased toxemic symptoms at 10 A. M., an easy version and extraction of male fetus 45 cm. long and 1,600 weight. Later all urinary symptoms cleared up.

CASE VI.—Rosa, primipara, Providence Hospital. Labor due April 10, 1913. March 31, 5 P. M., 25 c.c. fetal serum injected in buttocks. Vaginal examination showed labor not begun, head engaged at inlet. No pains until 2 P. M., April 1, when they began at long intervals. At 9.30 P. M. canal effaced, cervix thinned out, external os dilated two fingers. Pains during entire night, 7 A. M., April 2, dilation complete. Normal delivery of male child at 9.20 A. M., weight 3,600 gm., length 50 cm.

Among twenty-six cases reported by von der Heide, ten were followed by labor and three were reported to have reacted, but not sufficiently to lead to birth. Of the nineteen reported by Rongy twelve reacted favorably and labor followed as a result; seven were negative. Four of the six I noted reacted favorably, resulting in the termination of labor. Three of these were well developed, one in fact was overdue. None had either objective or subjective signs of labor contractions until after the injection which led to the termination of labor. Of special interest is the fifth case of preeclamptic toxemia which reacted to the serum when only thirty-four weeks pregnant. The result was a premature but healthy child. Both von der Heide and Rongy were able to bring on labor in cases slightly before term by using large injections. Von der Heide believes the birth act to be the result of an anaphylactic action. At first thought this does not seem possible as we know that anaphylaxis occurs as the result of the introduction of a foreign proteid in an organism which has been previously sensitized by injection of the same foreign proteid. So it appears absurd to conceive of a mother being sensitized from protein grown indirectly from herself, and later suffer from an anaphylactic process induced through the circulation of proteids indirectly produced from herself. I believe the rule has even been laid down that anaphylaxis cannot occur from the injection of a serum of like species.

However, we must consider the fetus as a separate organism whose nourishment is only received by osmosis and dialysis through the placenta. Also the fetus while having the same form externally as the mother is not essentially the same. The fetal blood cells are quite different from the maternal ones. There is a lack of development in certain fetal structures, and increase of others. It is quite possible that some of the protein constituents of the fetus may be quite different from any of the mother. This is probably true of the end products of protein metabolism in the fetus. We know that groups of placental cells are carried into the maternal circulation from about the fourteenth day of pregnancy. Abderhalden has shown that there is a proteolytic enzyme found in the maternal body to digest those proteid placental cells which enter into the maternal organism. It is possible and very probable that certain other fetal proteids are carried into the maternal circulation. At first the amount of these is small but this increases enormously as pregnancy nears its termination. As the fetal proteid is carried into the maternal circulation, it arouses the digestive action of a protein-splitting enzyme. This results in the enormous increase in quantity of the enzyme specific for the digestion of that proteid. This enzyme remains an intracellular fixture ready for further work when necessary. Thus the organism is sensitized toward the birth substance. If this proteid is the end product of fetal metabolism, the amount would be increased within the fetus toward the end of fetal development. Then possibly from intrauterine pressure, or more probably because of numerous spots freed of syncytium, large quantities of the proteid birth substances pass into the maternal circulation. These are at once set upon by the enzyme developed in great amount for the digestion of these proteids. The result is that the proteid is altered in such a way as to free a poisonous group from the birth substance which is capable of producing an anaphylactic shock whose effects are centered in the uterus, which is most sensitive to the effects of this protein toxin. Vaughan(7) has pointed out that certain proteids have predilections for certain places. It is possible that digestion of and subsequent anaphylaxis from birth substances occurs mostly in the uterus. Dale has shown that uterine muscle of the guinea pig reacts strongly and immediately to anaphylaxis. The uterine fibers exhibit a definite rise of tonus in response to extreme dilutions of antigen. The antepartum contractions of the uterus are probably due to a minor anaphylactic shock of lesser degree than that present in true labor. So also in false labor the process has not been severe enough to cause labor to proceed to its termination. Missed labor and overtime pregnancy are possibly due to an insufficient flow of birth substances into the maternal organism.

This affords an interesting explanation for the frequent miscarriages and premature labors of syphilis. On account of the inflammatory disturbances in the placenta, increased amounts of birth substances enter the maternal circulation before the usual time, thus causing early birth, anaphylaxis, abortion, miscarriage or premature labor. The miscarriages of nephritis may also be indirectly due to changes found in the placenta. Eclamptic toxemia may be explained as due to excessive amounts of toxins freed from the birth substances attacking the liver and possibly other organs.

While von der Heide and Rongy lay stress on sensitizing the patient before the final injection, I believe this to be unnecessary. The woman near the end of pregnancy is probably already sensitized. All that is needed to start parturition at term is the passage of a sufficiently large quantity of the birth substances to produce uterine birth anaphylaxis. When failure occurs after experimental injections there is probably not sufficient of the birth substance in the serum injected. Also the sensitiveness or susceptibility of the uterus is an important factor in determining the degree of reaction. Sauerbruck and v. der Heyde have demonstrated this in their experiments on rabbits.

In speaking of augmentation of labor we must turn to another substance which nature makes use of in helping to stimulate labor pains which have already begun. Since the discovery by Dale(8) in 1906 that the injection of pituitary extract caused uterine contractions, much use has been made of this substance as an oxytocic agent. Overlooking the diuretic, pressor and galactagogue activities of the extract of the infundibular or posterior lobe of the hypophysis cerebri, we must consider the ecbolic action as of the greatest importance. Erdheim and Stumme(9) have shown the increase in size and weight of the pituitary gland in pregnant women as well as change in color from grayish red to white. Also it is shown to be capable of increased secretion during pregnancy. After parturition there is an involution which is complete at the termination of the lactation period. The extract has been proven to have a specific action on uterine fibers in augmenting contractions. Large intravenous injections in pregnant animals have produced abortions.

Since first used by Bell(10) in England for its oxytocic action the extract of the posterior lobe has been used extensively to augment uterine contractions during labor. Hofbauer(11), Studeny(12), Stern(13), Vogt(14), and others, have reported good results in shortening labor.

I have collected thirty cases from my private practice in which pituitrin was given to hasten the termination of labor which had begun. Of these eighteen were primiparæ, twelve multiparæ. All had been measured and were found to have average or even larger pelves. In no case was there any contraindications for the use of it. The average time from the injection of the extract to the end of the second stage among primiparæ was 4.3 hours. Average time of labor was 15.2 hours.

Mrs. F. N. (Case II) had a normal pelvis; the membranes had ruptured before labor began. As labor proceeded normally, she was given morphia the first and second nights. I consider the failure of 3 c.c. of pituitrin to produce results to be due to uterine exhaustion. Easy low forceps delivery was indicated because of weak fetal heart, and discolored amniotic fluid.

Mrs. E. B. (Case IX) also had a dry labor. She rested well the two nights she was in labor. The uterus reacted well to pituitrin showing that her uterus had the reserve strength to respond to the stimulus given.

Mrs. F. M. (Case X) also dry labor. Uterus did not respond to 3 c.c. of one preparation, but did splendidly after the fourth cubic centimeter of a fresh preparation.

The average time from the injection of pituitrin in the multiparæ to the end of the secondary stage was 2.33 hours and the average time for the complete act of labor was 6.5 hours. Most of these cases responded well to 1 c.c. of pituitrin. Except in the cases noted, the response was very evident in the longer duration of contractions, shorter intervals between them and greater strength. This was noted by the patient herself at the end of five to ten minutes after injection. In a few there seemed to be a tonic contraction with severer clonic contractions added at regular intervals. Mrs. E. W. (Case XXX) had a typical tonic contraction from the beginning of pituitrin activity until the end of labor.

Two of the multiparæ are of special note, showing the activity of the uterus after the injection, whereas previous labors had been protracted and exhausting. Mrs. E. W. (Case XXX) had a forty-eight-hour labor and a twenty-four-hour labor terminated by breech extraction previously. After the injection in her third labor, it took only forty-five minutes for the termination of labor from a uterus whose os was dilated only 2 cm. at the time of injection. Mrs. L. S. who had a dead child after twenty-nine hours in first labor, had a precipitate labor after one injection. From a uterus whose external os showed only 1 cm. dilatation, labor was completed in just one hour.

Considerable work has been done experimentally to demonstrate the action of the hypophyseal extract. In the nonpregnant uterus of lower animals there is an increased activity of muscle action, but contractions are weak; a small increase of muscle tonus is noted. There is very slight response of the uterus in early pregnancy over that a nonpregnant one. Abortion cannot be produced by the extract alone, though when started by other means the process is hastened. The nearer term, the greater effect resulting from the injection of the extract. There is an increasing susceptibility of the uterus to the action of pituitrin stimulation as pregnancy advances. The nearer term, the stronger the contractions produced. The maximum effect is seen during labor at term, and the effect increases from a minimum at the beginning to a maximum at the termination of the second stage.

During lactation the effect is marekd but less so than during labor, but both uterine tonus and contractions are increased. The susceptibility of the uterus to pituitrin postpartum decreases gradually until the end of lactation, when the susceptibility is equal to that of the nonpregnant uterus.

It has been my experience that the human uterus is affected in a similar way to that of lower animals. There seems to be a variability in individual susceptibility to the stimulating action of the extract. In normal labor the extract from the individual's hypertrophied hypophysis no doubt acts as a powerful aid to the act. In cases of inertia there is probably a deficiency either of the birth substances from the fetus, or of the pituitary extract. Administration of the extract from a lower animal supplies the deficiency.

During pregnancy the pituitary gland hypertrophies just as the thyroid and mammary glands do. The hypophysis reaches its maximum hypertrophy at term. At this time the birth substances from the fetus probably act as hormones do in stimulating the secretion of the posterior lobe. This gland functionates increasingly during labor, reaching its maximum effect during the driving out period. From this time on the secretion lessens until the end of lactation. Synchronously the gland undergoes involution.

It has been the intention of this paper to point a rational way to control labor at term. The effect of pituitrin has been too well demonstrated to need further comment. Where there is a deficiency of this extract in the individual, the necessary amount can be easily supplied.

If, as I believe, the inception of parturition is caused by an anaphylactic action of proteid birth substances from fetus to mother, we are in a position to control this physiological act. The exact substance will no doubt be found in some of the lower animals and then the same may be expected in man. The danger of anaphylactic shock must be kept in mind because of the possible harm to the individual who receives the injection.

CASES IN WHICH PITUITRIN WAS USED.

Primiparæ.

Name	No.	Date	Dilatation of os ext.	Time from inj. to end*	Hours in labor†	
Mrs. C. S......	1	Feb. 23, 1913	Complete	20 min.	5¼ hr.	
Mrs. F. N......	2	Feb. 6, 1913	2 cm.	26 hr.	75 hr.	Pelvis normal, age 30 yr., parts inelastic.
Mrs. C. K......	3	Feb. 2, 1913	8 cm.	1¼ hr.	5⅓ hr.	
Mrs. M. P......	4	Jan. 31, 1913	8 cm.	1⅙ hr.	7⅓ hr.	
Mrs. C. P......	5	Feb. 6, 1913	5 cm.	1¼ hr.	9 hr.	Breech extraction.
Mrs. K. H......	6	Feb. 21, 1913	6 cm.	2 hr.	7 hr.	
Mrs. M. H......	7	Feb. 21, 1913	Complete	1⅙ hr.	5 hr.	
Mrs. J. W......	8	Jan. 24, 1913	6 cm.	4⅓ hr.	12 hr.	Primipara 34 years.
Mrs. E. B......	9	Jan. 18, 1913	9 cm.	3 hr.	38 hr.	3 c.c. given.
Mrs. F. M......	10	Feb. 12, 1913	1 cm.	10 hr.	13 hr.	5 c.c. given, soft parts tense.
Mrs. C. B......	11	Jan. 10, 1913	7 cm.	2¼ hr.	8 hr.	
S. S......	12	Jan. 27, 1912	5 cm.	6 hr.	11 hr.	Dry labor.
Mrs. W. T......	13	Nov. 20, 1912	5 cm.	6 hr.	13 hr.	
Mrs. J. S......	14	Aug. 7, 1912	4 cm.	5½ hr.	10 hr.	
Mrs. A. H......	15	July 10, 1912	7 cm.	2 hr.	9 hr.	
Mrs. K. M......	16	Apr. 27, 1912	3 cm.	3⅓ hr.	12 hr.	
Mrs. S......	17	Oct. 11, 1912	4 cm.	2½ hr.	11 hr.	
Mrs. B......	18	Nov. 1, 1912	8 cm.	1 hr.	21 hr.	Forceps.

* Average 4.3 hours. † Average 15.2 hours.

Multiparæ.

Name	No.	Date of confinement	No. Labor	Dilatation of os ent.	Time from inj. to end*	Hr. in labor †	Remarks
Mrs. J. A......	19	Feb. 17, 1913	2	5 cm.	1½ hr.	8	12 hr. 1st. child
Mrs. L. S......	20	Feb. 7, 1913	2	1 cm.	1 hr.	2⅓	29 hr. 1st. child
Mrs. Wm. H...	21	Feb. 14, 1913	3	7 cm.	1⅙ hr.	3	Previous short labors
Mrs. W........	22	Mar. 5, 1913	3	6 cm.	1½ hr.	6	Previous short labors
Mrs. O. H.....	23	Nov. 1, 1913	3	7 cm.	1⅓ hr.	4	Previous short labors
Mrs. P. R.....	24	Dec. 29, 1913	3	5 cm.	2 hr.	6	Previous short labors
Mrs. D........	25	Aug. 16, 1913	3	4 cm.	2½ hr.	7	Previous short labors
Mrs. C. M.....	26	Dec. 9, 1913	3	3 cm.	4 hr.	13	Previous short labors
Mrs. F. M.....	27	June 19, 1913	4	4 cm.	5 hr.	14	Previous short labors
Mrs. F........	28	July 15, 1913	3	3 cm.	4½ hr.	7	Previous short labors
Mrs. J. M.....	29	July 22, 1913	3	7 cm.	½ hr.	4	Premature 33 wk. child
Mrs. E. W.....	30	Jan. 19, 1913	3	2 cm.	¾ hr.	4	Previous labors 48 hr. Previous labors 24 hr.

*Average 2.23 hours. †Average 6.5 hours.

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THE PRESENT STATUS OF CESAREAN SECTION.*

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THE rapid development of obstetric surgery has carried Cesarean section through its first phase of technical achievement, and has placed at the disposal of operators a number of successful methods. With other developments in surgery these methods are designed to overcome the inherent dangers of the operation. In common with other operations in obstetrics and gynecology, in some cases the operator has the choice of the abdominal or vaginal route.

Vaginal Cesarean section is obviously unsuitable for cases where disproportion between mother and child, from pelvic contraction or fetal overgrowth, is present. It is especially well adapted to overcome the resistance of the cervix in the most rapid and accurate manner possible, and its greatest success is obtained in cases where the fetus is premature or ill-developed.

The advantages of this method of operating are the avoidance of opening the peritoneum, the lessened tendency to shock, and the fact that an experienced operator with few assistants can perform the operation in a private house.

The disadvantages of the operation are the fact that the exact size of the fetal head cannot be previously ascertained, and that during delivery laceration may occur, opening the peritoneal cavity and producing severe bleeding. Incision in these cases is carried through a portion of the genital tract, rich in blood-vessels and lymphatics inviting the development of septic infection.

Vaginal Cesarean section is chiefly used at present in the treatment of eclampsia where rapid delivery is selected, and less often in the treatment of accidental separation of the normally implanted placenta. In good hands its maternal mortality compares favorably with other operations, while the nature of the cases in which it is employed results in a high fetal mortality.

In delivery by abdominal section the maternal dangers from the operation are primarily septic infection and hemorrhage; secondarily, the bursting of the uterine or abdominal incision, the formation of adhesions between the uterus, peritoneum and other viscera, the risks of anesthesia, and the occasional development of thrombosis and embolism. The operation itself has a low mortality and morbidity rate from shock.

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* Read before the Section on Obstetrics and Gynecology, Medical Society State of New York, April 30, 1913.

Abundant clinical experience and laboratory research confirmed by experiment, show that the primary danger from infection arises from the escape of the contents of the uterus into the peritoneum. In cases where the membranes have long been ruptured the amniotic liquid is usually infected, and this may infect the peritoneum at operation. Infection may also arise from faulty aseptic technic, which in well-appointed hospitals is largely obviated. Hemorrhage arises when the uterine muscle is so relaxed or diseased that it fails to adequately contract when the uterus is imperfectly or improperly sutured, and when the uterine stitches become loosened or give way.

To avoid the danger of infecting the peritoneum from the uterine contents, various methods have been devised. We have heard with great interest and pleasure the account by Dr. Asa B. Davis of his method of incising the uterus in the abdomen while the edges of the abdominal wound are kept in close approximation with the external surface of the uterus. The high incision in the abdomen facilitates this endeavor and lessens the risk of hemorrhage.

The purpose of this operation is to essentially make it extraperitoneal, so far as communication with the peritoneal cavity is concerned. An additional advantage is claimed for this method, that it disturbs the abdominal viscera as little as possible and lessens the tendency to hemorrhage and shock.

In recent years the profession of Germany has revived the effort to open the uterus outside the peritoneum by extraperitoneal section. Among others, the laparoelytrotomy of Thomas has been revived by Döderlein to a considerable extent. Numerous modifications of Frank's original method have appeared, among which is that of Sellheim, whereby the uterine, visceral and parietal peritoneum are sutured, delivery being effected through a peritoneal fistula. This has been tried by Kelly, and with modifications by Hirst.

The purely extraperitoneal section has failed in the hands of German operators, for the peritoneum is frequently opened, and must inevitably be, because the operator cannot foretell the size of the presenting part and cannot accurately gauge the extent of his incision to avoid lacerating the peritoneum. The fact that those who have attempted this method of operating have been obliged to open the peritoneum and produce a peritoneal fistula to make the operation safe, indicates the failure of the original method. Operation through a peritoneal fistula is of too recent origin to permit an exact appreciation of its value.

The majority of operators do not attempt extraperitoneal section, but are careful to practise extra-peritoneal and extra-abdominal emptying of the uterus. This accomplishes with a large measure of success the indication to prevent the contamination of the peritoneum by the uterine contents. By this method the abdomen is opened near the umbilicus and the incision prolonged in either direction sufficiently to permit the turning out of the uterus. While an assistant raises the womb the operator carefully protects the omentum and intestine by large soft gauze pads wrung out of hot sterile salt solution. The abdomen is completely closed from the entrance of uterine contents. If the foot of the table be raised moderately, and the uterus be turned slightly to one side, the contents of the uterus can be extracted without soiling the peritoneum in any appreciable degree. Whether the uterus is to be retained, amputated, or extirpated, the risk of contamination from its contents is reduced to a minimum. If the uterus is to be retained, it is accurately closed by silk suture through the muscle, supplemented by a continuous peritoneal suture, the anterior surface of the uterus thoroughly cleansed by salt solution, and the uterus replaced in the abdominal cavity and covered by mesentery. The suture of the peritoneum, followed by that of the muscle, closes the abdomen.

The danger from hemorrhage in all forms of abdominal delivery is obviated by the use of freshly boiled silk to ligate the muscle and vessels, supplemented by the covering of all vessels by peritoneum.

The danger of rupture of the uterine and abdominal incision, following section, is avoided by the employment of silk to close the uterine muscle, and by a firm and competent retentive dressing on the abdomen. For the latter, broad strips of adhesive plaster, overlapping at the edges, have proven satisfactory; in one of my cases complicated by bronchitis, the stitches were removed on the tenth day from the abdominal wound, which was healed. The resident physician who dressed the case did not follow his orders, and substituted an insufficient tape dressing for the broad adhesive strips usually employed. In a fit of violent coughing the patient burst the abdominal wound, forcing the intestines out beneath the dressing. These were immediately replaced and the wound brought together, followed by an uninterrupted convalescence.

No practical method exists by which adhesions between the lines of suture in the uterus and peritoneum and the surrounding viscera can be absolutely prevented. In no case, in my experience, has such an adhesion been serious in its results nor especially detrimental to the patient.

When one considers that many deliveries by abdominal section are emergencies performed upon patients without previous preparation, the dangers from anesthesia and shock are remarkably little.

The technic of delivery only has become a familiar matter to modern obstetricians, but important problems still await solution in other branches of this important subject. Perhaps chief among these is the question, "What shall be done in cases where we suspect that the uterus at the time of operation is already infected?"

There is abundant evidence to show that the birth canal in apparently healthy individuals contains bacteria capable of becoming pathogenic in prolonged labor. Attempted delivery by forceps, repeated vaginal examinations demanding the use of dilating bags, the replacement of the cord, frequent vaginal douching, and manipulation of any sort during prolonged labor, must inevitably change innocent to pathogenic bacteria and result in infection.

How can the obstetrician called to perform delivery by abdominal section deal with this condition successfully?

The rule should be strictly made and followed that all cases subjected before operation to attempts at delivery or to frequent manipulation, must be considered as suspected cases. Where we know the training and habits of the practitioner who has had the patient in charge, the knowledge that he is intelligent and faithful in antiseptic precautions, may take the case from the category of infected cases and place it among those of suspected cases; but where patients have been maltreated by practitioners the case must be considered as practically infected. Another element of importance is the mechanical injury done to the uterus before section. In my experience, the blade of the obstetric forceps has been thrust through the uterus into the abdominal cavity in two cases by practitioners who attempted to apply the forceps. The uterus has been completely or partially ruptured in others. The bases of the broad ligaments and the tissues surrounding them have been repeatedly found infiltrated, and to some extent lacerated. In such cases, where attempts at delivery have been made without adequate antiseptic precautions, the case must be considered as infected. In suspected cases the obstetrician must endeavor to save the uterus if possible. The age of the woman, and the question as to whether she has a living child, must be taken into account. In a multipara, forty years of age or older, it may be entirely proper to remove the uterus for the safety of the mother. In a young woman in her first confinement, or with but one child, in a suspected case the effort to retain the uterus is imperative. From my experience, if the uterus be thoroughly irrigated with hot salt solution and packed with 10 per cent. iodoform gauze, such suspected cases result satisfactorily. The vagina must be thoroughly sponged out with bichloride solution and packed with bichloride gauze. By this method good results have been obtained.

When infection is undoubtedly present we have had excellent results with the Porro operation. The ovarian arteries and the arteries of the round ligaments are separately tied, a narrow clamp made for the purpose tightened across the lower uterine segment, the uterus amputated above the clamp, the remaining portion of the uterine lining above the clamp is disinfected with carbolic acid and alcohol, and the peritoneum is closed around the stump. The cut edges of the stump are powdered with iodoform and tannic acid. While convalescence is necessarily slow, the results have been in our hands excellent.

Another problem demanding attention in Cesarean section is the question of sterilizing the patient. In clean cases where husband and wife request this, we prefer hysterectomy, retaining one or both ovaries, covering the stump with peritoneum, and dropping it into the abdominal cavity. If the condition of the patient permits, the appendix may also be removed. The abdomen is closed without drainage. Another method of sterilization which has proved efficient consists in excising the Fallopian tubes at the uterine cornua, removing entirely the uterine extremities of the tube by a V-shaped incision, and adding to this removal an inch of the tube itself. The cut edges remaining are closed by continuous catgut.

It has been abundantly demonstrated that ligation of the tubes, or resection of a portion of the tube in its continuity, are inefficient.

The tendency of modern obstetric surgery is to make delivery by abdominal incision, if possible, elective. The patient must be spared the ordeal of labor, and a suitable and advantageous time selected. Experience shows that but little dilatation of the cervix is required to drain the lochial discharge, and in my experience, should the cervix be narrow, a finger may be passed through from above when the uterus is opened, and a strand of gauze from the uterine cavity left for drainage forty-eight hours. Many think the use of gauze drainage in such cases is unnecessary. In cases where some physical condition of the patient makes labor dangerous, as in thyroid toxemia, heart lesions, great nervous depression, elective labor becomes to the patient a great boon, and lessens considerably her risks.

A most important advantage in delivery by abdominal section accompanied by eventration of the uterus, lies in the fact that the operator can adequately determine the exact condition of the pelvic viscera. He may find a uterus whose substance is so altered by pathological changes that its retention is inadvisable. Multiple fibromata of the uterus are often not detected until section is performed. The existence of a pelvic tumor, or of salpingitis, may first be revealed at section. An appendix adherent to the broad ligament may also be first diagnosticated when seen.

Another advantage of elective abdominal section is strikingly seen in cases where labor does not develop normally, but where it is practically impossible to find the cause for the abnormality. Thus, in two cases in my experience, in primiparæ older than the average, the pelvis was ample, the general vigor of the patient normal, the mental and nervous condition normal, and yet the termination of the usual period of pregnancy brought no labor. Finally, inefficient and fugitive pains developed, which produced great anxiety and depression, with failing strength. Elective section was practised in each instance, when the uterus was found the site of small multiple fibroids, so embedded in the muscular tissue that they could not be recognized by physical examination before operation. Fortunately, the anterior uterine wall afforded sufficient healthy tissue to permit the suture and retention of the uterus, as both patients earnestly desired more than one child. In each case uninterrupted recovery followed the operation.

When we remember that the induction of labor in a uterus with pathological muscle is a difficult and dangerous procedure, we can see the advantage of treating these cases by surgical means. The method of operating chosen for abdominal delivery may sometimes be utilized to cure a permanent lesion of the generative tract. I have recently had occasion to perform the Porro operation upon a multipara who had suffered for years from prolapse and retroversion, for which she declined operation. She had been accustomed to retain the uterus in position by stuffing cotton into the vagina. Her last pregnancy was declared by her husband and herself to be the last, and they accepted delivery by abdominal section at term without labor, by the Porro operation, because the stump thus left in the lower end of the abdominal incision would effectually prevent prolapse of the pelvic tissues. This it has done completely and the patient is in good health.

The decision to retain one or both ovaries in delivery by abdominal section must depend upon the age of the patient and the condition of the ovaries and tubes. It is rarely necessary to sacrifice both ovaries, and if choice is to be made the left should be preserved, while the right ovary and tube and appendix should be removed. Experience shows that inflammation and adhesions of these organs are not common.

We are especially interested in the application of delivery by abdominal section to placenta prævia and accidental separation of the normally implanted placenta. Placenta previa, to my mind, is an ectopic pregnancy, quite as dangerous as tubal or other intra-abdominal pregnancy, and to be treated by surgical means only. As experience increases in this direction, we find that results are more satisfactory than by any other method of treatment. Such cases are as much hospital cases as tubal and other extrauterine gestations, and in hospital treatment by section, gives excellent results. Personally, I have had thirteen abdominal deliveries for placenta prævia and placental separation, with the recovery of all the mothers. All of these were suffering from the results of hemorrhage, and three of them were apparently dying and greatly exsanguinated.

The usual operation has been the classic section with gauze packing, saline transfusion into a vein being given at the same time, and other methods of stimulation freely employed. It is interesting to observe how completely hemorrhage ceases so soon as the uterus is empty, and how thoroughly gauze packing prevents the postpartum hemorrhage which often follows the removal of the placenta through the vagina in cases of placenta prævia.

For the general practitioner confronted in a private house with a care of placenta prævia which cannot be brought to hospital, the Braxton-Hicks version, using the fetus as a plug and disregarding fetal life, remains the safest and most efficient treatment.

In our cases of delivery by section those children that were in good condition at the time of operation have survived. The fetal mortality, however, must always be high in these cases.

The question may arise, "Where does the general practitioner come in, in discussing the question of delivery by abdominal section?" We may reply to this, that he comes into this question exactly as he comes into the question of the treatment of appendicitis, ovarian tumor, uterine fibroid, and ectopic pregnancy. He should be able to make a diagnosis of the most common abnormalities in obstetrics, and of the great and vital dangers to child-bearing women. In the interests of his patients, and for his own reputation and future practice, he should secure for complicated obstetric cases the same careful surgical attention given to appendicitis, ovarian tumor, uterine fibroids, and ectopic gestation.

May I be permitted to give briefly the results of my experience in abdominal delivery in figures?

Up to the present time I have operated upon 103 women in good general condition, and apparently uninfected, by various forms of abdominal delivery.

Case No. 33 of this series died and autopsy showed a general peritoneal infection with the bacillus proteus vulgaris. We have never ascertained how this germ gained access to the peritoneum, for we immediately made bacteriological tests of our suture material, sterilized dressings and apparatus in general, but without a clue.

The remaining series of seventy cases in good condition have recovered without maternal death. No infant at term, in good condition, in this series, has been lost, the fetal mortality rate from the operation being practically nil. The mortality rate of the 103 cases, namely one patient, is .97 of 1 per cent.

Thirty patients infected by various forms of disease, including puerperal infection, bronchopneumonia, and virulent toxemia, have been treated by abdominal delivery with ten deaths, or 33 1/3 per cent. The fetal mortality in this series was considerable, as most of the children were dead or dying when the patients were brought to hospital.

It is interesting to note that the patients among this series who recovered, were a series of twenty cases of puerperal infection treated by the Porro operation.

Abdominal delivery was also performed upon two patients, one dead, the other dying; these being postmortem sections. The total number of cases was 135. The maternal mortality of the whole series of cases was 8%.

As regards the various forms of operation chosen for these patients, there were seventy-nine classic Cesarean sections, thirty-four hysterectomies with intrapelvic treatment of the stump, twenty Porro operations, and two postmortem deliveries by incision; thirteen cases of placenta previa and placental separation with hemorrhage of greater or less severity, some of them exsanguinated, were treated by abdominal delivery, with no maternal death.

So far as mortality and morbidity were concerned, the different methods employed gave equally good results.

These operations were undertaken for indications now recognized by the majority of obstetricians, contracted pelvis, disproportion between mother and child, eclampsia, threatened uterine rupture, labor complicated by pelvic tumor and physiological incompetence for labor.

250 South Twenty-first Street.

PITUITARY EXTRACT IN UTERINE INERTIA.*

BY

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Introduction.—Like many others, the writer was much impressed by the many reports which began to appear in medical literature in 1909 and subsequently upon the use of pituitary extract in obstetrics, and soon after began to experiment with the drug.

My experiments extended to the use of the drug not only as an oxytocic to induce labor, and in primary and secondary inertia of the first and second stages of labor and immediately after the third stage, but also in incomplete abortion; to produce peristalsis, to assist the bladder to empty itself, and as a galactogogue.

We are limiting the present paper, however, to the use of pituitary extract to prevent or relieve uterine inertia in the first and second stages and immediately after the third stage and in Cesarean section and also to induce labor.

Seventy cases, of which records have been kept, are here reported, and these cases are from two hospital services, namely, Bellevue and Manhattan Maternity, and from private practice.

They include:

In the first and second stages	39 cases
Immediately after the third stage	19 cases
In Cesarean section	6 cases
For the induction of abortion	6 cases
	70 cases.

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[*] Read before the American Gynecological Society, May, 1913.

Preparations and Administration.—In our earlier experiments we used a proprietary preparation of the drug procured in 1-ounce bottles, each cubic centimeter of the solution representing 0.1 gram of fresh pituitary gland (infundibular portion).

Although we used this preparation freely, often several cubic centimeters at a dose, still, either because the preparation was originally unreliable or deteriorated with age, our results were quite uncertain.

Vaporales or ampules of the drug should be used in order to secure the best results.

In the seventy cases herewith reported, only the ampules were employed.

Ampules of three different proprietary preparations were used in our seventy cases. In one preparation each cubic centimeter represents 0.1 gram of the fresh posterior lobe of the pituitary body (Burroughs, Wellcome and Co).

In the second preparation each cubic centimeter represents 0.1 gram of the gland (Park, Davis and Co).

And in the third a cubic centimeter, represents 0.2 gram of the fresh posterior lobe of the pituitary body of the ox (Armour and Co).

For decided action of the drug usually 0.4 gram, 2 c.c. of the first and third, and 4 c.c. of the second preparations referred to, is required as an initial dose. Repetition may be called for, as in our experience, the action of the drug disappeared in about twenty-five minutes. If no response is secured after the second dose, administered half hour after the first, the remedy may be abandoned. In our earlier cases we used half the foregoing dose, with occasionally negative result.

In our experience, when injected into a muscle, no local action occurred, there was little if any discomfort and no toxic symptoms were in any instance observed.

Pituitary extract was often combined with other drugs acting upon the heart, in shock cases, and with ergot when pituitary extract had insufficient action on the uterus, and without, as far as our observation went, compromising the action of these drugs.

Pituitary extract should have no place in normal labor, its administration should be confined in obstetrics to instances of primary and secondary inertia, to postpartum hemorrhage and Cesarean section, in the last as a substitute for ergot.

Inertia of the First and Second Stages.—The drug apparently acts by collecting small noneffective contractions into larger more active ones. These stronger contractions may last several minutes, ten according to some, but it is denied by several observers that the drug ever causes continuous tetanic contractions of the uterus (tetanus uteri) even when given in maximum doses, namely, 0.12 gram within an hour and a half.

While theoretically pituitary extract causes intermittent contractions of the uterus, in practice when full or repeated doses have been given and too great resistance to delivery exists, these contractions approach to the continuous in character, and clinically must so be reckoned with. This phenomena we have repeatedly demonstrated.

Take the early part of the first stage, before the cervix is shortened and little dilatation has taken place. Full doses of pituitary extract are here in our opinion equivalent to the use of ergot, and should not be used. Premature separation of the placenta, fatal compression of the fetus and even uterine rupture can readily take place; we have observed all of these.

Inertia, primary or secondary, with the vaginal cervix still present, and only one or two fingers' dilatation, should be treated not with pituitary extract, but along other well-recognized lines, until the case shall have at least advanced toward the end of the first, if not into the second stage.

Then in cases presenting a dilated or readily dilatable cervix, with inertia existing as an indication, and not too much resistance to overcome, pituitary extract renders valuable aid. By resistance I refer not only to small vaginæ in primiparæ and resisting pelvic floors, in both primiparæ and multiparæ, but to prolonged rotation of a right occipto- or mento-posterior position.

Great danger to the child exists from compression of it and the placental site, by the almost tetanic contractions, following of use of pituitary extract under such circumstances.

My present plan in instances in which I have reason to fear a too great resistance either in the cervix, vagina, or vaginal outlet, or in a malposition, is to give a small tentative dose of the drug, repeated if necessary. My object being not a prompt, so-called brilliant, termination of the case by tempestuous uterine contractions, with possible danger to the fetus and soft parts, but rather to bring the presenting part within easy range of a simple forceps operation.

In fact in seven of our thirty-nine cases, in which the drug was used in the second or latter part of the first stage, forceps were resorted to following this plan of procedure. Low forceps in four instances, median in two, and the nature of the forceps operation unrecorded in the seventh.

Most of our thirty-nine cases of inertia in the last part of the first and in the second stage were promptly delivered by pituitary extract, the action of the drug being more positive in multiparæ than in primiparæ.

Our observations show further, that the drug acts best at full term, in the second stage of labor, and if administered shortly after spontaneous or artificial rupture of the membranes.

Its action was least marked when used for excessive bleeding following the third stage of labor.

In a few instances the drug in our hands was apparently inert, although portions of the drug from several ampules and different proprietary preparations were administered and our technic carefully looked into.

In our earlier use of the drug a single dose of 0.1 gram was used. This evidently was too small a dose as seen from the notes of six of our histories.

Thus case 3,333, Manhattan Maternity, 0.2 gram, "very little if any results"; case 3,567, Manhattan Maternity, a primipara, 0.11 gram, "little if any result"; case 3,568, same hospital, 0.4 gram, "no appreciable result"; case 3,613, same hospital, 0.4 gram, "little of any result"; case 3,682, same hospital, 0.2 gram, "no result"; case 3,796, same hospital, 0.1 gram, head on the perineum, "no result."

After the Third Stage.—In the nineteen cases in which the drug was used, immediately after the third stage for postpartum hemorrhage, our results were disappointing. So much so that we considered its action here most unreliable and not as positive as the ergot preparations of our nineteen postpartum cases, we found no effect of the drug in two cases; it was necessary to use ergot in two instances; but acetic acid douches in two more; to pack the uterus in seven instances, and in the remaining six cases only were good uterine contractions observed.

In Cesarean Section.—In the writer's clinic pituitary extract was compared with ergot (ergole ♏ xxx subcutaneously) to secure uterine contraction in Cesarean section.

Our observations show that both cause uterine contractions, pituitary extract more promptly and more vigorously. Ergot takes longer to act and hence must be given earlier in the operation, but its action is more prolonged.

On Tuesday, May 21, 1912, in a case of Cesarean section at the Manhattan Maternity, before my third-year students, a full dose of ergot (ergotole) was given intramuscularly at the beginning of the operation as had been my custom, to secure a tight uterus and prevent hemorrhage.

On the following Tuesday, at the same hospital, in place of the ergot we gave, in another case of Cesarean section, 0.4 gram of pituitary extract.

The effect of pituitary extract in the latter case was plainly shown upon the uterus after the removal of the child. The uterus was prompt to contract, presenting a blanched ball-like appearance; there was somewhat less hemorrhage than in the case to which ergot had been administered the week before, by reason of the contracted muscle and vessels.

It was the concensus of opinion, however, of those who witnessed both cases, that there was nothing startling in the action of pituitary extract over that of ergot.

Then again the pituitary extract patient passed a large clot from the uterus twelve hours after the operation indicating at least that the action of the pituitary extract was not permanent.

For the Induction of Labor.—We have failed to induce labor by the use of the drug alone. It should be stated, however, that when pituitary extract is given some time subsequent to the introduction of gauze, a bougie or hydrostatic bag into the uterus, that the drug apparently initiates uterine contractions.

It is our belief that in these cases the drug strengthens already existing contractions, which latter have been unrecognized by the patient or attendant.

In one instance 0.4 grms of the drug (Parke, Davis and Co.) given for the purpose of inducing labor at term in a patient overdue (Case A. G., No. 3,422, Manhattan Maternity) apparently accomplished the purpose, as active labor set in three hours after the injection.

This case is not reported as one of induced labor, because we ascribe the sequence of events to coincidence, as the action of the drug is almost immediate, and lasts not over half an hour.

In Abortions.—As an oxytocic in abortion cases the drug was disappointing. It was used in only a limited number of cases, none of which are included in the seventy cases here referred to. The following is one illustration of our experience: Mrs. M. the wife of a physician, himself much interested in the action of the drug, was given five doses of 0.1 gram each of pituitary extract to terminate an inevitable abortion at the fourth month. Intense contractions resulted extended over a period of two hours, but they caused no further dilatation of the cervix or expulsion of the ovum.

Other Uses.—Observations were made in a limited number of cases, too few to draw conclusions from, upon the action of the drug in atony of the bladder and intestines upon its effect upon the abdominal muscles, and general muscular system; as a galactogogue, and in abortion cases.

The action upon the bladder and intestines was apparently negative, as also upon the voluntary muscles.

In several instances of diminished or practical absence of the milk supply, the effect of the drug was apparently brilliant.

For example, in the case of T. M., Bellevue Hospital Obstetric Service, September 19, 1912, the milk supply practically ceased on the tenth day postpartum.

Two grams of pituitary extract was then administered. At the end of thirty-six hours the breasts were distended and at the end of seventy-two hours the breasts were overflowing. The reappearance of the milk secretion here we look upon as a coincidence, as our other cases were frankly negative.

CONCLUSIONS.

1. Ampules or vaporales of the drug should alone be employed, as in our experience, constant results failed when the pituitary extract in bulk solution was used.

2. There are three reliable proprietary preparations of the drug now on the market; all of these were used at different periods in our cases.

3. For decided action, 0.4 gram of the drug is usually called for, although in ordinary cases, with little obstruction, half that dose we found sufficient.

4. As the effect of the drug lasts but thirty minutes, repetition of the dose is often called for.

5. Intramuscular injection is usually satisfactory; causing no local reaction or pain. Further, no toxic symptoms were observed from the use of the drug even in maximum doses.

6. Pituitary extract may be combined with ergot when the action of the former fails, and with heart stimulants in shock cases, without compromising the actions of these drugs.

7. Pituitary extract has no place in normal labor, the administration should be confined in obstetrics to instances of primary and secondary inertia, to postpartum hemorrhage and Cesarean section, in the last as a substitute for ergot.

8. The drug produces strong intermittent uterine contractions often prolonged for several minutes. We have, never observed true continuous tetanic uterine contractions (tetanus uteri).

9. Although theoretically the uterine contractions are intermittent, practically in the face of resistance, the contractions approach to the continuous in character and clinically must be so reckoned with.

10. Full and even small doses of the drug in the first stage of labor, have caused in our cases fatal compression of the fetus, premature separation of the placenta, and deep rupture of the cervix.

11. In the first stage or where decided obstruction exists in the second stage, I give small tentative doses of pituitary extract, not with complete delivery by means of the drug in view, but to bring the head in easy reach of a simple forceps operation. Seven of our thirty-nine cases were thus treated.

12. Pituitary extract acted promptly and efficiently in most of our thirty-nine cases of inertia in the first and second stages. Its action was more positive in multiparæ then in primiparæ; it acted better at full term than in premature cases; also better in the second than first stage of labor when administered shortly after the spontaneous artificial rupture of the membranes.

In the nineteen cases in which the drug was used immediately after the third stage for postpartum hemorrhage due to inertia, our results were disappointing. So much so that we consider its action here most unreliable and not as positive as the ergot preparations.

In our eighteen postpartum cases, we found no effect of the drug in two cases; it was necessary to use ergot in two instances; a hot acetic acid douche in two more; to pack the uterus in seven cases, and in the remaining six cases only were good uterine contractions observed.

13. In Cesarean section we could not observe any advantage of pituitary extract over ergot, aside from the observation that the former acted more promptly and hence need not be administered so early in the operation.

14. In induction of labor the drug failed to initiate contractions, but apparently initiated them after the use of gauze, the bougie or hydrostatic bag. Our belief is that the drug strengthened

already existing contractions not yet apparent to patient or physician.

15. For primary inertia in abortion cases, our results with the drug were disappointing.

16. For atony of the bowel and bladder and as a galactogogue our results were frankly negative.

17. The dangers to mother and child in the indiscriminate administration of this drug for primary or secondary inertia of the first or second stages of labor must be reckoned with.

Only a few of our thirty-nine cases of inertia were frankly in the first stage of labor and these were our earlier cases. The remainder were in the second stage or border line cases just merging into the second stage.

We consider the use of the drug in the first stage a dangerous practice, liable to cause death or deep asphyxia of the fetus, separation of the placenta, uncalled-for laceration of the cervix and possible uterine rupture.

18. We have to report, of our thirty-nine cases of inertia in the first and second stages, two and probably four still-born children due, in our opinion to the use of pituitary extract, before full dilatation, and three instances of deep laceration of the cervix requiring suture to control the bleeding.

19. We look upon the use of pituitary extract before full dilatation or dilatability of the cervix as equivalent to the use of ergot at this time. In fact it is probably more harmful than ergot, by reason of the more powerful contractions produced and the uncertainty of its action.

20. We have repeatedly observed prolonged tempestuous contractions, when the drug was given in the face of too much resistance, closely simulating tetanic contractions of the uterus (tetanus uteri).

21. The action of the drug is most uncertain. One can never predict in a given case, either from the amount of the drug administered, or from the character of inertia and the obstruction to be overcome how powerfully the drug will act upon the uterus.

22. We have repeatedly observed both in private and hospital practice that 0.2 gram of pituitary extract, half the usual dose commonly employed, produced such prolonged and powerful uterine contractions that uterine rupture was imminent and anesthesia was required to control the action of the drug on the uterus.

23. In our opinion the drug should never be employed for inertia

in any stage of labor, unless anesthesia is at hand for immediate use, and preparations complete for immediate operative delivery if necessary, to avoid uterine rupture.

24. Finally, with due regard to its action, and possible dangers, pituitary extract is a most valuable addition to our resources for the treatment of primary and secondary inertia.

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CONSERVATISM IN GYNECOLOGY.*

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An operation is performed to save life, to prolong life, or to make life more comfortable. A vastly greater number of operations are performed to render life more comfortable, than either to save it or to prolong it. As the science of surgery has developed, surgical work has become more and more safe, and the field for conservative work and work done entirely to relieve suffering and discomfort has become wider and wider. To-day we perform rather extensive operations to relieve a discomfort, that even a few years ago would be considered entirely too trivial to take the risk of a surgical operation. The organ at fault may be repaired, the position may be corrected, or may be entirely removed. In many cases an important organ, with a definite function, may be entirely removed without any bad effect on the organism, the work of that organ being taken up by another organ of the same kind, or its function being carried on by other different organs, but with somewhat similar function. Certain organs have no use, so far as we know, and their removal does not in any way, of course, interfere with the action of the organism. All this is true in general, and it is in a special way in our gynecological work. We are dealing in most of our work with organs that have a function highly specialized, important at a certain period of a woman's life, and of no importance after that period, and of no importance to her health. In fact, we do not go very far from the truth when we say (if we can exclude certain nervous influences, which sometimes result from the removal of the ovaries) that women would be in better health if they did not have uterus, tubes and ovaries. Even the women of the lower grades of civilization suffer a certain amount of discomfort from the menstruation. If a patient comes to us with a certain amount of discomfort, and on our examination we find comparatively little that is wrong, we appreciate that it is not easy to get rid of that discomfort, but if on our examination we find sufficient to warrant us to make a clean sweep, as it were, removing the uterus, tubes and ovaries, we feel much more confident of curing that discomfort. With this knowledge in mind we can understand why there is so much unnecessary and mutilating surgery in gynecology. Even to the honest and conscientious gynecologist, this knowledge that a complete operation, with the removal of tubes, ovaries and uterus, will cure, is a constant temptation. Local treatment with applications, tampons, pessaries, etc., will accomplish much, but it is often associated with periods of discouragement both to the patient and to the physician, and the knowledge that an operation will cure the symptoms, often blinds them both to the fact that it is with the sacrifice of organs that may be greatly wanted at some future time, and the loss of which may mean great unhappiness to the patient.

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Gynecological diseases are in general concealed. A woman is told that she has a cancer of the breast, and she can determine herself whether she has or not, and frequently consults a second surgeon as to its removal. In gynecology it is different. If she is told that she has a tumor in her ovary, she has to take it on the statement of her physician, and knows herself only her subjective symptoms. Furthermore, either from natural reluctance of pelvic examinations, or from greater confidence in the man who has been treating her, she usually relies on a single opinion.

There are several factors that influence us in our decision whether or not we should advise a woman to suffer a certain amount of discomfort in order to retain her pelvic organs. Naturally if a woman is beyond the child-bearing period, she has no further need of these organs, and it would be foolish to suffer in order to retain them. During the child-bearing period the problem is less easy. A woman may have the number of children that she wants and feel that she will never have another, but her children may die or she may change her mind. The woman of wealth and luxury who is able to take plenty of rest and little exercise can avoid an operation, when her less fortunate sister who has to support herself and her children should have one for the same pathological condition. These factors must be constantly in mind in determining the need of many gynecological operations.

In what I have thus far written, I have tried to call attention to the following points—that the pelvic organs are unnecessary to the life, and in the main to the health of the woman, and that the complete removal of them will do more to remove all her discomforts than no operation or than any conservative operation, also that a gynecological patient is most often in the hands of one man, and that the findings are known only to him and his assistants, and, finally, that the nature of a gynecological operation is influenced by the age, position in life and number of children of the patient.

Taking the subject of conservatism in gynecology, I shall consider,

First, conservatism in the tubes.

Second, conservatism in the ovaries.

Third, conservatism in the uterus.

First, Conservatism in the Tubes.—New growths in the tubes are so rare that we may leave them out entirely, and consider only the inflammation in the Fallopian tubes. The first and by far the most important step in conservatism of the tubes is either not to operate at all or to postpone operation as long as possible. An acute inflammation in a tube is a different thing than acute inflammation in the appendix. A pus tube may rupture, but it rarely does so, and even in acute cases, if a diagnosis of salpingitis can be made, and the appendix excluded, the proper procedure is to wait. Two things may be gained by waiting—one, that the condition may subside and no operation at all be necessary; the other, that while an operation may be necessary, a less extensive one may be performed, if much of the acute inflammation is allowed to subside first.

Let us take a typical case, such as a young girl who has a gonorrheal salpingitis in the early acute active state. If the abdomen in such a case were opened, the pelvis would be found to be red and congested, and pus can be stripped from the ends of the tubes. These cases are not infrequently operated upon at this stage, with the diagnosis of acute appendicitis, and there are few men who can resist removing these tubes at this time. Of course, these tubes are a source of danger. There is no doubt that so far as the life of the patient is concerned, it would be safer to remove them. They are, however, important organs to her, they may be absolutely necessary to her future happiness, and their removal may wreck the remainder of her life. The proper course, beyond question, is not to remove the tubes, and they can be allowed to remain with only a reasonable surgical risk. Such a patient, of course, properly should not be operated on at all; she should be put to bed, heat, douches, etc., and allowed to wait until the acute symptoms subside. Such a case goes on to one of three conditions—she may subside and be symptomatically entirely cured, she may subside in part and have then a chronic salpingitis, or she may go on and develop a pyosalpinx. If the case subsides there is no further treatment necessary. If the case goes on to a chronic salpingitis, then we have a condition that is very trying to both the patient and to her physician, at times discouraging to both. We are, however, dealing with organs of great importance to her, and it is necessary for us to save them if it is possible to do so. The all-important element in accomplishing this is that of time and rest. These can be aided with tampons, astringent applications, douches, etc. Usually such a case can be made fairly comfortable most of the time, but with occasional exacerbations, following some exposure, overexertion, or unusual conditions of life, when the old trouble is started up and she will have a course of treatments. An operation for a chronic salpingitis may become necessary and will be spoken of later. If the case goes on to the formation of an abscess, an operation will sooner or later be necessary, and one of two operations can be selected. The abdomen can be opened and the tubes removed, but an abdominal operation at this stage frequently means that the whole of each tube and the whole of each ovary will have to be removed, and this is too radical if it can be avoided. The other and better plan is to drain the tubes through the posterior fornix. This can be easily done, unless the tubes are too high, and then to wait again until the acute symptoms have subsided. The case may be entirely cured by this drainage. If a subsequent operation becomes necessary, it may be possible to save a piece of one tube, which will make it possible for the girl to become pregnant, or a part of one ovary which will be enough to keep up her menstruation with its associated mental influence. There is distinctly less risk to the life of the patient, if the tubes are first drained and the abdomen opened later, than if the abdomen is opened as the primary operation. Certain of the cases of a chronic salpingitis which have not gone to the formation of a pyosalpinx, certain other cases where the fornix has been opened but has not been cured, certain other cases of pyosalpinx that are located out of reach of the posterior fornix, come to an abdominal operation. Here we have to consider our original problem—the age of the patient, the desire or possibility of her having children, the possibility of nervous symptoms if everything is removed, the mental effects of the absence of menstruation. We want to relieve the patient's discomfort, but we do not want to destroy any function it is possible to save. Without going into a description in any way of the operation, or the operative methods for these conditions, I merely wish to speak of certain fundamental principles on which we could work. The first is, a normal tube is better for a patient than a normal tube together with a diseased tube. In other words, if one tube is normal and the other tube is diseased, even not greatly diseased, that diseased tube should be removed. The one single tube will carry on all the functions necessary and should be called upon to do so if the tube on the opposite side is diseased. It is a mistake to resect a tube on one side, when the tube on the other side is normal. It is necessary to bear in mind, too, that while the chance of pregnancy may be very small, if we can give the patient a chance we may greatly affect her life. It is one thing to tell a woman that she cannot have children, it is another thing to tell her that she has a chance, though that chance is a small one. Therefore, if we can save a small piece of a tube, 1 or 2 inches, even 1/2 inch, we can tell that patient honestly that she may become pregnant, although we know in our own minds that the chance of her doing so is not very great. If our patients have given us all the time possible, we are much more likely to save a portion of a tube, than if we operate during the acute stage. Naturally, we leave this small piece of tube from the side that is least diseased. Not infrequently, the patient's history will state that she has very definitely more pain on one side than on the other. In such a case we should remove entirely the tube on the side that is the seat of the greatest pain, saving a small piece on the side where the pain is less. Again, not infrequently, the pain is located entirely on one side,the other being entirely free from pain. In such a case there will be no question, we must remove the tube on the side where the pain is present, with the other side we can be more conservative. It is not always possible for us to understand from our gross examination why a patient has pain on one side and absence of pain on the other, as so far as we can tell both sides are equally diseased. If both are so badly diseased that it is not possible to save any, then, of course, they should be entirely removed, well into the wall of the uterus; not merely tied off. We should then, if possible, direct our attention to saving the uterus and one ovary, or even part of an ovary, in order to keep up menstruation, and to avoid a bad effect from its cessation.

Second, Conservatism in the Ovaries.—Much that I have said regarding the treatment of inflammatory diseases in the tubes holds equally well in the treatment of inflammatory diseases in the ovaries, and I shall not repeat it here, but shall direct your attention to two points in conservative work on the ovaries. The first will be in regard to resecting the ovaries, the other the treatment of the ovary when the uterus is removed.

Resecting an ovary often leads to the development of a small cyst, which gives rise to more trouble than the ovary itself. I, therefore, do not resect or suture an ovary unless forced to do so. If one ovary is normal and the other one enlarged or cystic, I either remove the enlarged or cystic ovary entirely or I do nothing whatsoever to it. One ovary will carry on the function of the two, and one normal ovary is better than one normal and one diseased ovary. If both ovaries are cystic and the patient complains of pain only on one side, then the ovary on the side on which the patient complains of pain should be removed; the other left as it is. If an ovary has been torn in separating adhesions, or if from other cause, and suturing or resecting is necessary, then, of course, it must be done, but it is always associated with the risk of a small cyst forming in the ovary, and this on account of its weight giving definite symptoms.

The treatment of the ovary when the uterus has been removed has led to much discussion among gynecologists for years, the idea being that the removal of the ovary bringing about an artificial menopause causes certain definite nervous symptoms which could be avoided by the retention of the ovaries, even when there is no uterus present to carry on the menstruation. My own feeling is that the influence of the ovaries under these conditions has been somewhat overestimated. While I have seen marked symptoms following the removal of the ovaries, it is not common, and when we bear in mind what delicate organs they are and how prone they are to get into trouble, I prefer, ordinarily, to remove them unless there is a strong reason for not doing so, if the uterus has to be removed. If, for example, the ovaries are a seat of an inflammatory condition, it is better to remove them than to save them, even in a comparatively young person. If, however, the ovaries are apparently normal and the patient is young—say in the twenties or thirties—it is desirable to save them if it is possible to do so, because the effect of the artificial menopause is more marked in the early years of a woman's sexual life than in the later years. The older the patient the less is the necessity of saving the ovaries. If the patient is past forty, the removal of the ovaries has little direct influence on a woman's nervous system. Women, however, have certain very definite, though at times erroneous ideas regarding the influence of the removal of the ovaries. They have an idea that they grow fat, that they have hair grow on their faces, that they have more marked nervous symptoms if the ovaries are removed than if they were retained. Knowing that they have this belief, I frequently make it a point to leave the ovaries in order to be able to say that I have done so, in case any of these unfortunate occurrences arise—that is, it is largely a matter of self-defense. Most men interested in gynecological work make an effort to save one or both ovaries whenever it is possible to do so during the age of the natural menstrual life.

Third, Conservatism in the Uterus.—Here I wish to speak of two things—one, the treatment of the uterus when the tubes and ovaries have both been removed, and the other myomectomy. These are two places where the question of conservatism in the uterus is most important. Ordinarily, when the tubes and ovaries have both been removed, it is done for an inflammatory condition, and in the vast majority of cases where the tubes and ovaries are inflamed, the original focus is in the uterus. To remove the appendages and retain the uterus is frequently to retain the original focus. With the appendages removed there is, of course, no functional value in the uterus and, furthermore, it is an organ that very easily gets into trouble. If it is the seat of a chronic inflammation, it may be the cause of a persistent stubborn discharge, and unless artificially supported it is easy to get out of place and to give symptoms from its weight. It is my judgment, therefore, if the tubes and ovaries have been removed, that it is best to remove the uterus, assuming that the patient is in good condition and it does not add materially to the shock and duration of the operation.

In the treatment of fibroids we have the greatest opportunity for conservative work on the uterus. Whether or not a myomectomy should be performed depends in part on the number and location of the tumors and in part on the age of the patient. Naturally, if the woman is beyond the age of having children, the easier operation is the one that should be selected, and this is ordinarily a supravaginal hysterectomy. In the younger woman a myomectomy is the operation of choice, and this can be done more frequently than is ordinarily practised. There is, practically, no limit to the number nor the size of the fibroids that can be removed and the uterus preserved, if they are favorably located. It is possible to split the uterus in two halves, dissect out a large number of fibroids, resuturing the uterus without special risk to the patient. I have on two or three occasions done a myomectomy on a pregnant uterus without causing an abortion. Unless one has directed his attention to myomectomy, he does not appreciate the ease and certainty in which the operation can be performed. The myomectomy whenever possible is, of course, to be performed for two reasons—one is the question of pregnancy, the other is to keep up menstruation. It means a great deal mentally to a woman not to have the menstruation stop during her natural menstrual life.

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THE TREATMENT OF STERILITY BY INTRAUTERINE STEMS.*

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(With One Illustration.)

From the inception of gynecology, uterine displacements have been associated with dysmenorrhea and sterility as cause and effect. In the combined statistics of 866 cases reported by Biegel(1), Mayer, Kammerer and Jackson, uterine displacements were present in from 35 to 50 per cent. Faulty development of the cervix, uterus and vagina are most often found, and Hirst(2) says, "the commonest developmental anomaly responsible for sterility is stenosis of the cervical canal and a U-shaped anteflexion of the uterus." Bumm(3) thinks that two-thirds of all cases of sterility are due to faulty development. Emmet(4) in his study of uterine flexures found that the total flexures of the corpus and cervix was in the unmarried 25.80 per cent., in the sterile 54.76 per cent., and in the fruitful 19.46 per cent. Rongy(5) in his recent study of 120 cases of sterility found 41.66 per cent. with flexures.

These conditions were recognized early in the study of gynecology, and gave rise to the obstructive theory of dysmenorrhea and sterility. Mechanical treatment was resorted to in all cases, and among other means the intrauterine stems were devised. In 1889, Manton (6) published a paper entitled. "Intrauterine Stems, Their History, Abuse and Use." He reviewed the literature for the previous fifty years and found that, in 1803, Möller used a pliable staff in the uterine canal to correct a displacement, and that the intrauterine stem was devised in 1843 or 1844. He states that in 1854 the Paris Academy of Medicine denounced the intrauterine stem as not only useless but dangerous, and that it should be totally abandoned in practice. Further he quotes West, who wrote in 1864 that its use was almost universally discontinued, and that probably in a few years more it would become a mere matter of history.

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The indiscriminate use of mechanical measures in a preaseptic age when little was known of the normal position of the uterus and less of its pathology, necessarily led to many disastrous results. With our more exact knowledge we are to-day using in these cases measures similar to those used when the mechanical obstructive theory of dysmenorrhea and sterility was generally accepted. Even the extreme measure of artificial fecundation as used by Sims is now being advocated in Germany by Hirsch(7). He reports sixteen cases with six successes.

We do not now recognize a stricture in the uterine or cervical canal, *per se*, as sufficient to bar the entrance of the spermatozoids. But we know that this stricture is most often the predisposing cause, and the exciting cause is some change in the mucous membrane of the cervix and the uterus. On these facts are based our operations for the treatment of dysmenorrhea and sterility.

The Dudley(8) operation was devised to relieve pathological anteflexion from the obstruction of the canal from collapse of the canal, and the obstruction of the blood-vessels from the collapse of the blood-vessels, by mechanically straightening the uterus.

The Pozzi(9) operation is based on the principle that a stricture at the external os causes an accumulation of the normal secretions in the cervical canal which may become the media for infective or saphrophytic organisms. Pozzi recognizes as the most frequent cause of dysmenorrhea and sterility a rather common malformation of the cervix in which the os is unduly narrowed, it is longer than normal and its axis is bent on the axis of the corpus, and causes a cervicocorporeal anteflexion of the uterus itself. In this condition he recognizes as an obstacle to fecundation, first, stenosis of the uterus, second, the bend in the cervical canal at the level of isthmus, producing flattening of the lumen, and third, difficulty of drainage of cervical mucus. The indication for this operation is to relieve these conditions by relief of the stenosis at the external os.

The Reynolds(10) operation is based on the theory that in an anteflexion of the cervix, the cervix is held forward by essentially nonmuscular structures, while the fundus is held forward only by muscular structures which are capable of relaxation. From his experience, the sterility so often found in these cases is due to an alteration of the endocervical mucous membrane, caused by a partial retention of the normal secretions of the uterine cavity, rather than a mere mechanical matter. Reynolds in a recent paper elaborates his theory of abnormal genital secretions as a cause of sterility and says " . . . . . no fact has seemed so certain than that women whose cervical secretions are thick, inspissated and tenacious, and consequently in mechanical stasis, are almost always, if not invariably, sterile." In his opinion this inspissation is probably the result of a secretion which is arrested behind a mechanical obstruction, and that the treatment is the long-established surgical principle of absolutely free drainage. This is to be accomplished only by one or the other cutting operations whose object is the straightening of the uterine canal.

Let us now take up the indications for the use of the intrauterine stem. Wylie(11) reports four out of five cases relieved of dysmenorrhea by the use of his stem. In the undeveloped uteri of young girls he especially advises its use. He recognizes maldevelopment as a cause of anteflexion with conical cervix, and says that the symptoms are not due so much to constriction and flexure of the cervical canal as from erosion by stopping up the mouths of the follicles and glands, thus causing disease rather than scar tissue.

Davenport(12) reports the use of the intrauterine stem in over 200 cases during the last twenty years, without a single case of pelvic inflammation resulting. He finds it adapted to cases of dysmenorrhea beginning at puberty with a not infrequent gradual increase in the severity of the symptoms in the course of years. The pain usually comes on with the flow, grows more severe, and attains its maximum in from six to twelve hours. The dysmenorrhea lasts from twelve to twenty-four hours, but subsides with the establishment of the flow. Usually there are no clots. Patients with such symptoms reveal on examination a small uterus with some degree of anteflexion, and a conical cervix with small external os. There is a relative narrowing of the canal at the internal os, in some spasmodic, but in the majority a real stricture. There is an increase of connective tissue at this point, with narrowing and much loss of flexibility in the canal. Davenport considers the anteflexed uterus as the most common cause of sterility. By use of the stem the anteflexion is corrected to a certain extent, the canal is kept partially dilated, the focus of inflammation is corrected at the internal os, and the cicatrix is absorbed. He also advocates its use in cases of amenorrhea due to lack of development of the uterus, and in the latter he leaves the stem in for nine months or a year.

Carstens(13) has used the stem for twenty years, and has advocated its use more strenuously than any other writer. He says "The stem is very useful in all those cases where the trouble is in the uterus alone." He lays most stress on the fact that the stem acts to develop the structures of the uterus. To accomplish this the stem must be long enough to reach the fundus to irritate slightly the uterus so that it will make efforts to expel it, and as a result of exercise the uterus will get stronger. He advocates its use in dysmenorrhea, in mittelschmerzen, in amenorrhea and in sterility. In the latter condition he thinks it should be left in for from four to six months. In amenorrhea in young girls with infantile type of uterus, in women with premature atrophy of the uterus and in fleshy women with scant flow, he reports good results.

Norris and Barnard(14) in a study of seventy-three cases of "Dysmenorrhea in Nulliparous Women without Gross Pathological Lesions" conclude that stenosis of the cervix is not sufficient to cause dysmenorrhea, but there must be added the excessive clotting properties of the menstrual blood within the uterus, which is most frequently brought about by shreds of endometrium which are thrown off at each menstruation. They also recognize as a cause the non-specific endocervicitis of Kelly. From their study they find that the expulsive, spasmodic or obstructive type of dysmenorrhea is the only form that gives any permanent hopes of relief. As the indication for treatment is to permanently dilate the cervical canal they advise the intrauterine stem. The stricture, in 50 per cent. of the cases, is at the internal os, and they find it hard to reach this point by either the Dudley or Pozzi operation.

This review shows that the indications for the cutting operations and the intrauterine stems are identical. The advocates of the latter method make their indications even broader. as they believe the stem influences an infantile uterus to develop, and a premature atrophic uterus to become normal.

I have arranged a chart to show the ultimate results of operations on the cervix and uterus in the relief of sterility. I realize the unreliability of statistics, but in this connection they will not be more misleading in one method of operative procedure than in the other.

RESULT OF OPERATIONS.

Operation reported by:	No.	Per cent. dysmenorrhea relieved	Per cent. sterility relieved	Remarks
Dudley's operation.				
Dudley	100	75	42.85	7 cases prolonged Ster.—3 relieved.
Wadsworth(15) (from literature to 1904).	37	72.9	?	13 sterile—4 relieved.
Wadsworth	33	78.7	30.7	Ant. wall op. 18 Oophorectomy 3 Alexander's op. 1 Ventral susp. 1 Appendix and ovary 1 Myomectomy 1
Rongy	11	?	27.27	
Brickner(16)	73	64.3	27	
Goldberger(17)	9	77.7	33.33	
Pozzi operation.				
Pozzi	?	75	25	
D. & C.				
Holden(18)	95	60	15	
Rongy	4	?	25	
Norris and Barnard	28	78.5	?	
Medical treatment and gradual dilatation.				
Blackner(19)	?	?	33.33	Estimated.
Rongy	33	?	27.27	
Combined operations				
Norris and Barnard	40	?	35.71	D. & C.— 28 D. & C. + Wylie stem 9 Dudley + Wylie stem 4 Dudley — 1
Rongy	36	?	30.5	D. & C. 4 Dudley 11 Stems 18 High amp. of cervix 3
Intrauterine stems.				
Davenport	200	?	25	
Wylie	?	80	?	
Beyea(20)	41	80 to 85	33.33	
Rongy	18	?	33.33	
Norris and Barnard	9	77.7	?	
Norris(21)	3	?	66.6	3 cases of sterility 2 cures: 1 after 29 years.

From an examination of this chart we find that all operations excluding the stem give relief from sterility in from 15 to 33.33 per cent., and relief or cure of dysmenorrhea in about 75 per cent. From the use of the stem there is a relief of sterility of from 25 to 33.33 per cent., and for dysmenorrhea 80 per cent. The exception to this is the per cent. of 42.85 given by Dudley in the treatment of seven prolonged cases of sterility, and the percentage of 66.66 of Norris in three cases. One of Norris' cures was in a woman of fifty, married to her first husband eleven years, and to a second husband fourteen years, without becoming pregnant, although divulsion had been done twice and once followed by curetage. I could find no statistics of the Dudley-Reynolds operation, but as Wadsworth in eighteen cases used practically this operation, we will assume 30.7 per cent. as approximately a fair average. Ten cases in his series were reported from the private practice of Dr. Reynolds.

The theoretical objection to the use of the intrauterine stem are (*a*) the danger of ascending infection, (*b*) a plug rather than a drainage-tube, and (*c*) the danger of injury to the uterus after the patient has returned to her usual vocation. All of these are disproven by the experience of its advocates. Carstens reports no bad results after the stem has remained in for four years, Beyea after one year, and Davenport recommends that it remain in the uterus in some cases of amenorrhea for nine months to a year. On a bacteriological basis this contention seems to be proven by the work of B. Strauss,(22) who reports a bacteriological study of sixty cases in which laminaria were used for dilatation. He showed that it was impossible to prevent ascending infection from vaginal bacteria, and demonstrated a certain percentage with acute exudative endometritis. He also showed that the clinical significance of this was of little consequence. In a series of 400 cases a rise of temperature occurred in only 7 per cent., but in no case did any additional complication result.

The intrauterine stems most often used are the hard rubber stems of Wylie (I), Davenport (II) and Chambers (III), and some glass stems, as those of Baldwin (IV). Carstens has recently had the Chambers stem made of silver, as he found that the hard rubber stems, when left in the uterus for any great length of time, caused a foul discharge.

The technic of the operation is the same as for a divulsion and curetage, except that most often the curet is used simply to explore the uterine cavity. The divulsion should be even more gradual and more complete than in a curetage. In some cases it is necessary to consume from fifteen to forty-five minutes to accomplish it. The uterine cavity should be measured and a stem selected at least 1/4 inch shorter than the uterine canal. The stem is introduced without force, sutured to the cervix except in the case of the Wylie or Chambers stem, which are automatically retained in the uterus. There are usually three sizes, of various lengths and diameters, except in the Davenport, which is made in but two diameters, and is from 2 to 2 1/2 inches in length. The patient remains in bed usually a week, but Carstens keeps his patients in bed from twenty-four to forty-eight hours. Some use a daily douche of boric acid or carbolic acid douche for a short while, or longer if there is any discharge. The stem is allowed to remain in the uterus for from four to six weeks, although Beyea advises three to six months. The patient is instructed to avoid violent exercise.

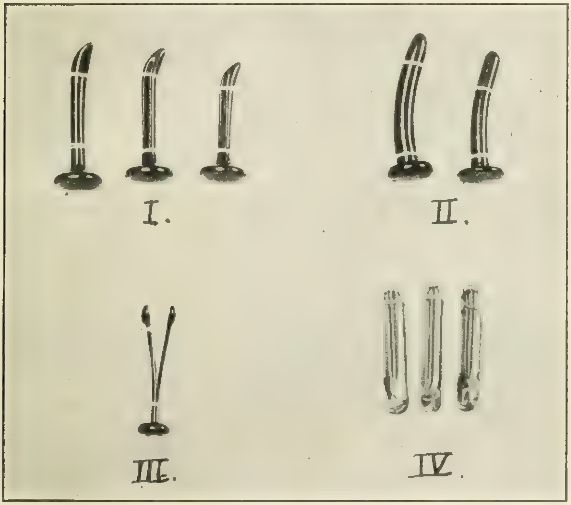

FIG. 1.

CONCLUSIONS.

I. In sterility the intrauterine stem gives as good results as the cutting operations. It causes less invalidism and is no more liable to sequelæ.

II. The intrauterine stem is applicable to all cases of anteflexion with abnormal cervix, except in extreme pathological anteflexion and extreme shortening of the anterior vaginal wall.

III. Even in those cases where it is necessary to resort to other operations, the intrauterine stem is a valuable adjunct.

IV. The intrauterine stem only becomes dangerous in the hands of the unskilled and those unable to exclude inflammatory lesions. This danger applies equally well to the cutting operations or a simple divulsion and curetage.

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320 CENTRAL PARK, WEST.

SPINAL ANESTHESIA.*

A CASE OF ACUTE APPENDICITIS OPERATED FOUR DAYS AFTER LABOR. RECOVERY.

BY
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M. R. C. S. (Eng.), L. R. C. P. (Lond.),
New York City.

THE word anesthesia is derived from the Greek and means the inability to feel. It is of comparatively recent origin and is supposed to have been coined by Oliver Wendell Holmes to describe the state of stupor which follows the inhalation of ether.

There are a number of drugs, which upon entering into the circulation induce a state of insensibility and when absorbed into the blood in sufficient amount produce anesthesia.

The ancient Chinese and East Indians used cannabis indica for this purpose either by inhalation of the fumes of the burning drug, or sometimes by administering it internally.

Pliny speaks of the use of mandragora to prevent the perception of pain during "cuttings or puncturings" and according to Apuleius it was customary to administer 1/2 ounce of mandragora in wine, and during the sleep which followed to mutilate, burn, or saw a limb without any pain whatever. In ancient Greece and Rome the stone of Memphis dissolved in vinegar was used for the same purpose, and in Persia a confection named haschish, the principal component of which was Indian hemp, was the favorite analgesic. A decoction of bryonia root had many advocates until the fifteenth century when Theodoric produced surgical anesthesia by means of the spongia somnifera.

This was prepared by boiling a sponge in the juices of mandragora, opium, hyoscyamus and hemlock until the water had evaporated. The sponge was then allowed to dry and put away for use. For inducing surgical sleep this sponge was soaked in hot water and laid over the nostrils of the patient, who after inhaling the fumes fell asleep. Resuscitation was accomplished by replacing this sponge with one soaked in vinegar. Other measures were sometimes employed either alone or as adjuvants to those mentioned above. Venesection until the patient fainted, the administration of nauseating drugs, principally tartar emetic, and hypnotism, were tried and locally pressure upon a nerve trunk or the application of ice used with good effect.

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*Read before the Section on Obstetrics and Gynecology of the New York Academy of Medicine, February 27, 1913.

Volumes have been written on the subject of the history and use of ether, chloroform, nitrous oxide, ethyl chloride, ethyl bromide, alcohol and oxygen, alone or in various combinations and sequences. To enter upon a discussion of these drugs would lead too far afield and extend this paper beyond the limits set for it; therefore, we shall confine ourselves to a consideration of the subject in accordance with the title of this paper.

To begin with, it is admitted that inhalation anesthesia is the best for general purposes. However, it is by no means a perfect method and leaves much to be desired in point of comfort and safety of the patient, and in certain cases is distinctly contraindicated.

Advanced diabetes is a condition in which inhalation anesthesia is especially dangerous. If coma supervenes it usually means the death of the patient. Ether cannot well be used in warm climates on account of its high volatility. Likewise it must be used with extraordinary care in the presence of a gas or other flame, or fire, for fear of an explosion.

Nitrous oxide, ethyl chloride and ethyl bromide anesthesia cannot be used for prolonged operative procedures, on account of their short duration. Ether, known as the safest anesthetic, has a distinct mortality rate of its own. As to the figures authorities differ. Keen places the death rate at 1 in 16,000 while Reclus puts it at 1 in 7,000. This does not give one any idea of the ether anesthesia morbidity, followed later by death. Thus Stolz claims one case of ether pneumonia to occur after about 550 anesthesias. The kidneys do not always escape some damage, because the drug is distinctly irritating to the urinary tract.

Ether is not to be used in the presence of arterial degeneration or aneurysm, for fear that the increased blood pressure caused by it may bring about rupture of a blood-vessel. It should be avoided in acute nephritis, certain operations on the abdominal organs where straining or postoperative vomiting may have serious results and certain operations on the brain. It is not suited for operations on the nose and mouth and it is contraindicated by the presence of bronchiectasis, emphysema and pulmonary tuberculosis. Alcoholic subjects take ether badly. Ether always diminishes the amount of urine and if pushed may cause suppression.

Chloroform has a conceded mortality of 1 in 2,300 anesthesias. It is absolutely contraindicated in heart affections with weakness of the organ. Myocardial degeneration, cardiac dilatation, also all conditions like exophthalmic goiter, asthma, or emphysema, which throw too much strain upon the heart, thereby weakening it, preclude the use of chloroform. In valvular disease with ruptured compensation, or imperfect compensation of the mechanical defect, especially in aortic regurgitation, in the lymphatic habitus and in subjects worn out by prolonged suppuration or cachexia, chloroform is very dangerous as an anesthetic.

If these statements are true, it follows that inhalation anesthesia is sadly in need of further improvement. This is probably the reason why the profession is constantly looking for a substitute.

In line with this desire narcotic anesthesia was instituted, the most popular being the morphine scopolamine combination. This is used hypodermically and acts fairly well in some cases. However, it has a mortality estimated at 1 in 600 and since the resultant anesthesia is not always perfect, it has been practically abandoned.

Urged on by the constant necessity of a method of destroying pain without loss of consciousness, experimentation is still going forward. Toward this much desired end, the discovery of the local anesthetic action of cocain by Dr. Koller in 1884 was a most valuable contribution. By the injection of a solution of cocain hypodermically or by its application to a mucous membrane, the terminal endings of nerves are so paralyzed that conduction of the irritation present cannot be transmitted to the higher centers and therefore the perception of pain is absent.

In another way the same result is attained by the method of nerve blocking in which a cocain solution is injected into the trunk of a nerve thus breaking its conductivity and making the whole area supplied by that particular nerve anesthetic.

Dr. J. E. Bodine is a most able exponent of this method of local anesthesia and were the method entirely devoid of danger it would be ideal. However, cocain has a strong affinity for nerve tissue and if used in amounts as small as from 1 to 5 milligrams may cause very dangerous symptoms (Weigand). Czerny has reported a death from the injection of 7 c.c. of a 1 per cent. solution of cocain. In this country, Corning, Crile and Cushing did a great deal in this field. Braun and Schleich are names well known in this connection and the latter's method of infiltration anesthesia is so recent in our minds as to need but passing mention. Lastly mention must be made of Bier's method of venous anesthesia in which a solution of novocain in salt solution is injected into a vein of a limb made bloodless by two constricting rubber bands. This method gives a high percentage of success. Bier in 134 operations found the anesthesia unsatisfactory in five cases.

Spinal anesthesia has also been called intradural, subarachnoid and lumbar anesthesia. Insensibility to pain is produced by the injection of certain substances of the cocain type into the subarachnoid space of the spinal canal. The region below the spinal segment thus treated becomes paralyzed, as to sensation and motion, for a time varying from one-half to two hours. Thus for instance if the injection of cocain, stovain, tropacocain or similar substance, is made at a level between the second and third lumbar vertebræ, all the parts below the umbilicus become deeply anesthetized so that any surgical procedure may be carried out within the lower abdomen and pelvis or amputation of the limbs practised without the slightest sensation of pain or discomfort, and while the patient is fully conscious. It acts almost as quickly and thoroughly in this respect. as if the spinal cord had been severed at that level. Sensation and motion return within about one and one-half hours.

The after-effects vary with the drug injected and especially with the size of the dose.

In the beginning cocain was used and some very unpleasant sequelæ were sometimes experienced. One of the most constant was the occurrence of severe headache which sometimes persisted for days. Very soon a number of deaths were reported which had the effect of dampening the ardor of the early enthusiasts.

While the well-known neurologist Leonard Corning of New York was the first man to experiment with spinal anesthesia, which work he published in the *New York Medical Journal* in October, 1885, Bier is to be credited with being the first to intentionally cocainize the spinal canal for surgical purposes. This he appears to have done without knowledge of the experimental work on animals done by Corning fourteen years before. Bier has done more than anyone toward perfecting this method and eagerly tried the newer remedies like stovain, alypin, novocain, etc.

In Europe the name of Tuffier stands out prominently among the early workers. Among those identified with marked progress in spinal anesthesia the names of Gobelski, Eden, Jedlika, Seldowitsch, Futh, Fink, Doenitz, Neugebauer, Hawley and Taussig will always have a place.

In this country, Simon Marx with a record of 300 spinal anesthesias in obstetrics, Crile and Bainbridge are entitled to special mention as pioneers. W. Babcock has probably had the greatest personal experience of any one man in this country, having himself administered spinal anesthesia in about 3,500 cases of general surgery, gynecology and obstetrics.

The first time spinal anesthesia used in obstetrics appears to have been in Bumm's Klinik at Basel in 1900. It was used to relieve the pains of labor. Stolz advises it only in operative cases. Freund advises its use in Cesarean section. Baisch excludes its use specifically in pubiotomy. Nevertheless many forceps operations, versions, manual removal of the placenta and stitching of the newly lacerated perineum have been done successfully by this method, likewise craniotomy, decapitation, etc. Practically all varieties of gynecological operations have been done, and are now being performed abroad under spinal anesthesia. Tropacocain is the favorite drug at present.

The writer has a strong leaning toward the use of stovain for spinal anesthesia more especially on account of its antiseptic properties. He uses the 10 per cent. alcoholic solution containing 0.04 of the drug, as follows: The patient is made to sit upright upon the operating table with her head bent forward and her back arched backward. The back is painted with tincture of iodine and the spine of the second lumbar vertebra located. The needle is pushed immediately below this a little to one side of the median line into the spinal canal, the stylet withdrawn and the needle pushed in until spinal fluid appears. The syringe is now attached to the needle and the contained stovain solution slowly injected. The needle is withdrawn. After the lapse of two minutes the patient is permitted to lie down and the operation proceeded with. If the blood pressure is low, or drops, digitalis and strychnine are administered hypodermically.

Case History.—Patient four days postpartum after a spontaneous labor complained of severe pain on the right side and suffered from temperature 104° F. Upon examination she presented all the signs of a ruptured appendix. In this diagnosis Professor Lilienthal, consultant to the hospital, concurred. Patient also had a very severe bronchitis and racking cough.

Spinal Anesthesia.—Upon opening the abdomen a considerable quantity of sero-pus was seen in the pelvis. Upon introduction of the hand it was found that the appendix was buried in a mass of adhesions and inflammatory products and that the attempted removal of this extensive mass even if feasible would have entailed too much risk to the patient. Accordingly the mass was broken into by the finger and a rubber drainage tube passed down to it. The abdominal wound was closed by layer suture in the customary manner except that on account of the cough and danger of rupture of the abdominal wound, the fascia was sewn up with two rows of sutures the first being a row of mattress and the next a running stitch over the cut edges. The patient experienced absolutely no pain during any part of the operation and made a splendid recovery in spite of her dreadful cough. She was discharged cured with her baby. It was a pleasure to note the abdominal silence in laparotomy by spinal anesthesia this feature being not so common when inhalation anesthesia is used. It was a relief not to have to contend with a patient training and forcing her intestines out of the wound and the total absence of symptoms referable to the stomach and intestines after operation was positively refreshing.

Finally in careful hands, selected cases will do well by this method of anesthesia. No doubt spinal anesthesia, like all other methods, has its limitations and is not to be used indiscriminately because like other methods of anesthesia it has its mortality rate. The main contraindication to its use are extreme debility, whether due to hemorrhage, sepsis, or long-standing disease and especially cases with very low blood pressure. Even the last, however, may be brought within the zone of safety for spinal anesthesia by the administration of adrenalin, digitalin and strychnin before and during the operation.

Its great field of usefulness will therefore be in those cases of disease of the heart, lungs or kidneys in which the use of the vapor anesthetics is contraindicated and more especially in major operations anywhere in the body below the nipple line.

122 East Seventy-ninth Street.

UNILATERAL FUSED KIDNEY.*

BY
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(With Two Illustrations.)

Congenital anomalies of the kidney are acquiring additional interest with the advance of renal surgery and the publication of the more unusual types, such as unilateral fused kidneys, appear to be desirable in view of the importance of the subject. The ordinary horseshoe type is often assumed to be the sole representative, but is in reality merely the lowest degree of renal fusion.

The situation is summed up by Birmingham as follows: "The fusion of the two kidneys may take place in varying extent. According to the degree to which union has taken place, we recognize three varieties of this condition. If the fusion be complete, the result is a disc-shaped kidney; on the other hand, if the union be slight and only between the lower extremities of the two organs, there is formed a horseshoe kidney. Intermediate between these two in the

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[1] Read before the Section on Obstetrics and Gynecology of the New York Academy of Medicine, February 27, 1913.

degree of fusion stands the sigmoid kidney (unilateral fused kidney). The disc-shaped kidney is placed in the middle line. Horseshoe kidney has one limb of the shoe on each side of the vertebral column and the connecting band between the lower ends of the two running across the median line. In sigmoid kidney (or unilateral fused kidney) there is an entirely different condition of things, for here one kidney (the right, usually) is transferred to the opposite side of the middle line, where it is joined on to the lower and inner part of the left organ; it is thus a form of unilateral kidney."

Seventy cases of fusion of both kidneys, representing transition forms of solitary kidney with displacement on the same side of the spine, were recently compiled from the literature by Papin and Palazzoli.

The rare occurrence of unilateral fused kidney is best illustrated by the fact that the "Handbuch der Urologie," by Frisch and Zuckerkandl, vol. ii, 1905, p. 59, refers to other forms of fused kidney, aside from horseshoe kidney, as devoid of clinical importance. That this is not always the case, is illustrated by the following observation:

Olga, J., age thirty-two. Previous history negative. Menses always regular, every four weeks, without pain since fourteen years of age until five or six years ago, when they were accompanied by pains which have of late increased. Patient is married, but childless. Was treated by a physician who told her she had a uterine tumor and besides a tumor on the upper right side of the abdomen which should be removed by operation.

Examination.—Small woman in moderately good condition of nutrition. All organs normal, except that on the right side of the abdomen there is a rather hard tumor, larger than a fist, slightly movable, extending to near the median line and disappearing toward the right renal region. The examination is not painful. Patient thinks that the tumor has grown larger recently. The left kidney cannot be palpated.

Vaginal Examination.—Retroflexion of the uterus. At the posterior wall of the uterus there are several small myomata which together are no larger than an orange.

Diagnosis.—Multiple small myomata. Suspicion of congenital unilateral fused kidney on right side.

Operation.—Laparotomy on July 28, 1912. Uterus fixed to anterior wall of abdomen and myomata removed. In order to determine the precise nature of the tumor, the posterior peritoneum was incised at the level of the tumor, and it was seen immediately that we had to deal with renal tissue, upon which the small peritoneal incision was closed. The left side was carefully examined by the operator and his two assistants in search of a kidney, but none could be found. Closure of the abdominal wound.

Several weeks after patient had left the hospital, I prepared several *x*-ray pictures together with Dr. Jaches of this city, to whom I am particularly indebted for the same. I may state at the outset that the cystoscopic picture presented absolutely normal conditions. This refers particularly to the position of the bilateral ureteral orifices, so that the picture of the bladder presented absolutely nothing abnormal. The aspect, however, changes when looking at the *x*-ray pictures, showing as they do that both of the catheters inserted into the ureters deviate to the right and that both are arrested at practically the same level. Injection of a 30 per cent. solution of Collargol into the renal pelvis demonstrated the fact that there are two renal pelves which are distinctly visible in the illustrations. We are therefore forced to the conclusion that we have to deal with a congenital fusion of two kidneys with separate pelves and separate ureters, the openings of which are both situated at normal positions in the bladder.

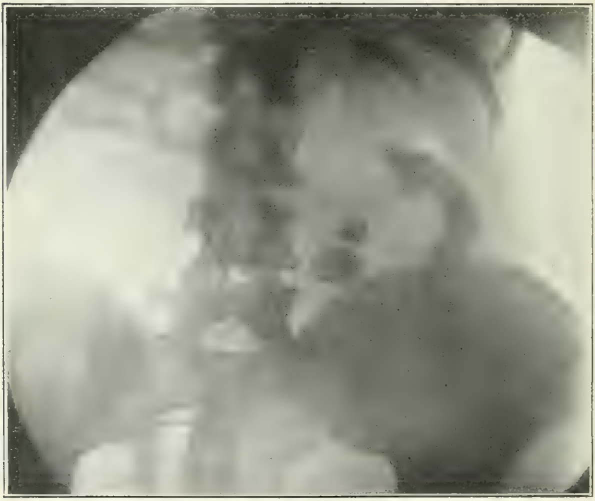

FIG. 1.—Unilateral fused kidney, showing the two pelves of the kidney filled with 30% collargol solution.

The case is of practical interest, (1) because the patient had been advised by another physician to have this tumor operated upon and (2) because we on our part had been able to make the diagnosis before operation with practically absolute certainty.

Unilateral fused kidney is an extremely rare occurrence. While the typical horseshoe kidney is found about once in 1000 autopsies, the unilateral fused kidney is very much rarer. Israel, who probably has the most extensive experience in renal surgery, states that he has found seven solitary kidneys of all varieties in 800 kidney operations.

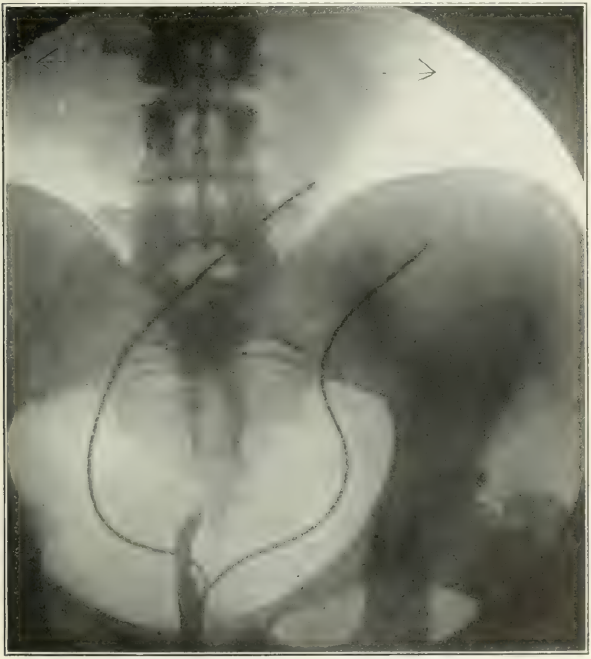

FIG. 2.—Unilateral fused kidney, showing catheters in ureters.

In a recent article on "The Clinical Importance of Horseshoe Kidney," in *Surgery, Gynecology and Obstetrics* (October, 1912), Eisendrath comments upon thirty cases belonging to this category, but most of them refer to so-called horseshoe kidney. All the cases were operated upon for various causes (pyonephrosis, hydronephrosis, tuberculosis, etc.). In all the literature on the subject which I have seen, my case is the only one in which a unilateral fused kidney was found to be absolutely healthy, patient applying for treatment principally on account of uterine complaints.

I would still emphasize the fact, and, in doing so, I follow Eisendrath's statements, that only four of the thirty cases were diagnosed as horseshoe kidney before operation; three of Israel's and one of Federow's. As stated above, in all these cases there were renal affections, so that surgical attention was at once directed to an affection of the kidney. Our case differs in this respect. As already stated, the patient was sent to us with the diagnosis of a uterine tumor together with the statement that there was another tumor in the region of the right kidney that should be extirpated, although patient never had the slightest complaint. These statements were calculated to direct our attention to the abdominal tumor, but after careful examination, we established the presumptive diagnosis of unilateral fused kidney.

Cystoscopy and *x*-ray examination could not be made until the operation was over. All that is left for us in the matter, therefore, is to explain what led us to make the presumptive diagnosis preceding operation.

(1) Patient is an extremely thin person with very thin abdominal walls which greatly facilitated the examination of the abdominal organs.

(2) Shape and position of the "tumor," which even on pressure did not elicit the least pain.

(3) The "tumor" had never caused the slightest trouble to the patient, who has suffered no loss of weight as in the presence of a malignant degeneration.

(4) In spite of the most thorough palpation, no organ could be found on the left side that could have been interpreted as a kidney.

It need not be specially emphasized that cases of this kind are of great practical interest, the more so, as renal surgery has reached such a high degree of development at the present time. If as in the present case no laparotomy had been done for a different purpose, the inforamtion gained thereby would not have been forthcoming, and the patient might have been subjected to a perfectly useless and perhaps fatal operation.

It is not the author's intention on this occasion to go into the literature on this subject, as he intends publishing later on a monographic article dealing in detail with the occurrence of unilateral fused kidney. He merely wished to report here briefly this rare condition and to point out its clinical importance.

1 WEST EIGHTY-FIFTH STREET.

LEIOMYOMA OF THE BREAST.

BY
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New York City

(With One Illustration.)

THE neoplasm which is here reported appears to be unique in the literature of breast tumors.

It occurred in a married woman of English birth, forty-six years old. She had noticed a tumor of the right breast which began deep in the breast four years ago; two years ago it began to enlarge. In the past six months it had occasioned some discomfort.

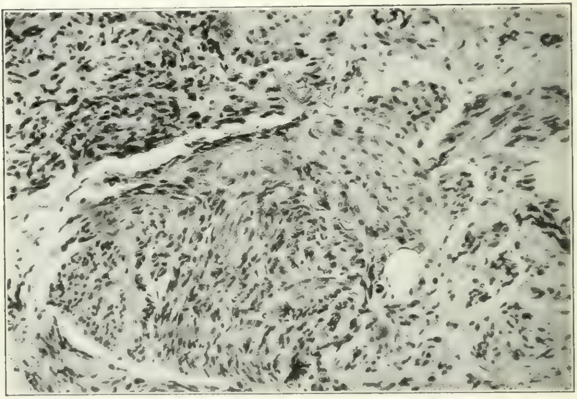
She consulted Dr. Bissell of the Woman's Hospital, and to him I am indebted for the clinical notes and the privilege of reporting the case.

On examination a firm, uniform tumor was felt in the upper outer quadrant of the right breast. This was freely movable under the skin and over the musculature; there was no retraction of the nipple, no ulceration, no fluctuation. The tumor outlines were not sharp but merged with the breast tissue.

At operation a firm, fibrous tumor was found which was well encapsulated. It was situated entirely to the outer side of the nipple and separated from the nipple by its capsule. It had apparently pushed the glandular part of the breast to one side. It extended down to the fascia over the pectoralis major, and its capsule was formed in part by this fascia, so that the pectoralis itself was exposed on the removal of the tumor. The distance of the capsule from the nipple was quite appreciable so that the tumor did not arise from the region of the nipple.

The tumor measured 6×3 cm. was oval, and had a well-defined capsule of compact areolar tissue. A mass of breast tissue was received with the tumor. On section the tumor was firm, fibrous and uniform in structure. There was a triangular cavity situated centrally, 1 cm. in its long diameter.

Microscopical examination revealed a ground substance of dense hyaline connective tissue with very few nuclei. In the midst of this were irregular bundles of smooth muscle fibers generally circular in outline and of varying size. Single fibers and very small bundles also occurred. The nuclei were straight, long, with square ends and occupied the centers of the fibers. The central space noted in the gross description appeared to be a widened lymph space but had no distinguishable lining. Blood-vessels were scanty; the large ones lay in the stroma and had definite muscular walls which took no part in the tumor formation. Throughout the bundles of myomatous cells could be seen fairly numerous capillaries with distinct endothelium. The myoma cells surrounded these in a circular formation suggesting an arteriole wall but whether the tumor took origin in that manner from the vessels or whether the cells were thus grouped for nutrition it is impossible to determine. There were many minute myomatous bundles without capillaries, showing that capillaries were not essential for their formation. An examination of the smallest muscle bundles which occurred in the areolar tissue at the edge of the tumor showed that these minute bundles were always circular, and that they often showed a central opening though without endothelium. One next finds definite arterioles, but the cells in the wall are loosely associated, the nuclei often at right angles to the lumen and the wall is much more cellular than normal. One can even trace small vessels cut longitudinally which show different degrees of myomatous metaplasia throughout their course. These appearances are very suggestive of an origin of the tumor from the walls of the blood-vessels. It may, however, be an embryonal inclusion although there



Leiomyoma of Breast.

is nothing to suggest that. Had it been attached to the nipple it would have suggested an origin from the smooth muscle fibers surrounding the excretory ducts. Other myomata reported have been of that type, analogous to the myomata of the dartos and labia majora, where large sebaceous glands occur. The smooth muscle fibers giving the erectile function to the nipple might also give origin to a myoma.

An examination of the literature of myomata of the breast discloses but few reported cases.

Kaufmann's "Allgemeine Pathologie" mentions their occurrence but gives no references or description.

Most of the reference books on diseases of the breast make no mention of myomata.

Borst, however, alludes to myomata of the nipple and refers to cases reported by Klob and Sokolow.

Ribbert mentions a tumor reported by Abramow. This however is an adenomyoma, containing glands. Ribbert states that he himself has removed a myoma of the nipple of the size of a cherry.

Klob, in his "Pathologische Anatomie der weiblicher Geschlechtsorgane, 1863" mentions two fibromata of the nipple, using the word fibroma in the sense of myoma.

Sokolow in "Virchows Archives, 1873" also describes a myoma of the right nipple, 1×1/2 inches in diameter.

These are the only cases of myoma of the breast to be found up to the present one, and none of the three is analogous to ours. Two of the three were tumors of the nipple of small size, while the third is an adenomyoma.

This recorded case appears to be unique in that it is a pure myoma of the breast proper.

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THE FAMOUS CASE OF MARY TOFT, THE PRETENDED RABBIT BREEDER OF GODALMING.

BY

CHARLES GREENE CUMSTON, M. D.,
Member of the Societies of the History of Medicine of France, Germany, etc.,
Boston, Mass.

(With Five Illustrations.)

SINCE the writings of Pliny on strange births, an enormous amount of literature, in the form of treatises, dissertations and tracts have appeared and even the great Paré composed and published in his complete works a long account of monsters.

In the latter half of the year 1726, all London was up in arms over the publication of a "Narrative" by Mr. St. André, anatomist to the King, in which he related in detail the remarkable case of a certain Mary Toft of Godalming in Surrey, who, the author declared, had given birth to seventeen rabbits up to the time of the publication of the pamphlet. To make a long story short, I will simply remark that the King ordered his surgeon, Cyriacus Ahlers, to visit the patient and then a few days later, the famous obstetrician, Sir Richard Manningham, was also requested by royal command to visit the woman and report upon the case.

I have in my library five tracts of great rarity pertaining to this most remarkable fraud, two published respectively by Sir Richard and Dr. Ahlers, another by a surgeon by the name of Thomas Brathwaite, one by an unknown writer, who undoubtedly was a member of the medical profession but preferred to retain his *incognito*, and lastly one containing the depositions of six persons taken before Lord Onslow, proving the fraudulent aspect of the case.

The affair, as I have said, caused great excitement and, as will be seen, many eminent medical men, including the famous Dr. Douglass and others, were consulted on the matter. Mr. St. André's narrative I shall not reproduce, as it would unnecessarily lengthen the paper, but the other five tracts referred to will be given *in extenso* on account of their great rarity and for the obstetrical and forensic science they contain, as well as the amusing features they present.

It is clear that the unfortunate St. André was greatly imposed upon by the two Howards, the Toft woman and her allies, who had hoped to be substantially remunerated by the King. I would also refer particularly to the dedication contained in Brathwaite's pamphlet to a certain learned Dr. Meagre, and to point out the gratuitous advertisement it gives to the pills compounded by the latter gentleman. Perchance the good Brathwaite had in the past obtained some remunerative fees out of consultations with the learned Meagre, but this is merely a surmise not to be seriously considered, although let it be said that human nature was quite the same in the early part of the XVIII century, as in the year of our Lord, 1912.

I have reproduced the title pages of the five tracts as I feel that they possess quite a degree of historic interest.

SIR RICHARD MANNINGHAM'S DIARY.

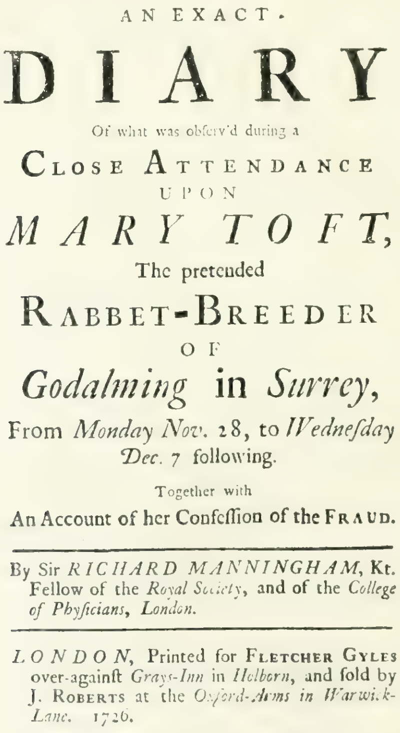
On *Sunday* Evening the 27th of *November*, 1726, Mr. *St. André*, Anatomist to His *Majesty*, having received an Express from Mr. *John Howard*, Surgeon and Man-Midwife in *Guilford*, giving him an Account that another Rabbet was then leaping in *Mary Toft*, sent me Notice of it by Letter about eleven of the clock the same Night, desiring withal that I would keep at home, and he would call upon me some time that Night, in order to carry me with him to *Guilford*.

I sat up till two in the Morning waiting for him, and then sent my Servant to his House, desiring to be excused, for I was then going to Bed; my Servant return'd before I was got into Bed, and told me Mr. *St. André* would be with me presently, and desired I would not go to Bed.

Accordingly, between three and four in the Morning, He and Mr. *Limborch*, a *German* Surgeon and Man-Midwife, came to my House; and Mr. *St. André* told me he had been at *Kensington* since he wrote to me, and desired me to go immediately with him to *Guilford;* adding, that it was his Majesty's Pleasure that I should go and see this *Godalming* Woman so much talk'd of, and after a strict Examination to make my Report concerning her.

Immediately we set out together for *Guilford* about four in the Morning, and arrived there a little after twelve at Noon: We stopp'd at Mr. *Howard's* House, who being out of Town we went directly over the way to the House where *Mary Toft* (the Woman said to be delivered of seventeen Rabbets) then lodged.

I found her in Bed, and after asking her several Questions in the presence of Mr. *St. André*, Mr. *Limborch*, and several Women and Midwives, I proceeded to examine her Breasts, wherein was a small Quantity of thin *Serous Matter* like Milk; I then felt her Belly all over carefully, which was soft, and not much larger than ordinary, and by no means like a Woman with Child; the Right side of her Belly, indeed, was somewhat bigger than the Left



AN EXACT

DIARY

Of what was obſerv'd during a

CLOSE ATTENDANCE

UPON

MARY TOFT,

The pretended

RABBET-BREEDER

OF

Godalming in *Surrey*,

From *Monday Nov.* 28, to *Wedneſday*
Dec. 7 following.

Together with

An Account of her Confeſſion of the FRAUD.

By Sir *RICHARD MANNINGHAM*, Kt.
Fellow of the *Royal Society*, and of the *College*
of Phyſicians, *London*.

LONDON, Printed for FLETCHER GYLES
over-againſt *Grays-Inn* in *Holborn*, and ſold by
J. ROBERTS at the *Oxford-Arms in Warwick-*
Lane. 1726.

FIG. 1.—Title-page of Sir Richard Manningham's Diary.

with a Hardness a-cross it, which when I press'd, she said it gave her Pain.

I afterwards diligently search'd the whole Vagina, and being well assured at that time all was clear from Imposture, I touch'd the *Os Uteri*, which was close and contracted in such manner that it would not receive so much as the point of a Bodkin into it's Orifice; the Neck of the *Uterus* was somewhat long; I then press'd against the *Uterus* with my Fingers opened in such a manner as to receive as much of the Body of the *Uterus* into my Hand as possible, which seem'd to me to contain something of Substance in its Cavity.

While I was thus examining I applied my other Hand at different times to the several Parts of her Belly, whereby it seem'd to me that there was Substance, not only in the Cavity of the *Uterus*, but also along the right side of the Belly, which I then judg'd to be the *Falloppian Tube;* but feeling no Motion all this while, I enquir'd of the Women then present how long it was since the Rabbet leapt (as they term'd it) and whether they were of Opinion it was now dead; to which they answer'd, the last time it leapt was about one in the Morning.

I left her for that time, and did not visit her again till about five in the Afternoon, jointly with Mr. *John Howard* her Surgeon, when I again examin'd her in like manner as before, and asking Mr. *John Howard*, whether he then thought the Rabbet was dead? He answer'd, he could not exactly tell, but had lately observ'd, if hot Clothes were apply'd, the Rabbet (if alive) would leap again; upon which I immediately ordered Clothes to be made very hot, and apply'd them my self to all her Belly, being very desirous to feel that leaping motion they so much talk'd of. Upon applying of the first Cloth the Motion began, which they called the leaping up of the Rabbet; it was indeed a Motion like a sudden leaping of something within the right side of her Belly, where I had before felt that particular Hardness.

The motions were various, sometimes with very strong Throws cross the Belly, especially on the right side, at other times with sudden Jerks and Risings, and tremulous Motions and Pantings, like the strong Pulsations of the Heart; and as I sat on the Bed in Company with five or six Women, it would sometimes shake us all very strongly: The whole appeared to me very different from any convulsive or hysterick Motion I had ever met with before.

We then left the Woman, and Mr. *Howard* parted from us, Mr. *St. André;* Mr, *Limborch*, and myself went to the *White-hart-Inn;* but within less than an hour Mr. *John Howard* brought us, wrapt in Paper, a piece of Membrane, which he said he had just taken from the Woman, and shew'd it us. I told him he ought to have sent for me, that I might have taken it away myself, being come down for that Purpose: To which he reply'd 'twas true, but he believ'd there was more to come, which I should take away before I return'd to *London*, or to that effect. Upon examining the Membrane which he brought, it appear'd to me like a piece of Bladder, but he insisted it was a part of the *Chorion*, and that he had more of it at home: Upon which I walked with him to his House to see the Rabbets and Membranes which he said he had taken from the Woman and preserved in Spirits of Wine.

Mr. *John Howard* ask'd me to go with him and see one of his Patients who was very ill; adding, he believ'd it would be some time before any more Membranes would come; and having left Orders to be sent for so soon as the Woman's Pains came on, we forthwith went thither, and from thence to Mr. *Castle's* at the *Priory*, where we met Mr. *Thomas Howard*, his Brother, and several Gentlemen of the Neighbourhood.

About eight in the Evening a Messenger came to us from the Woman and told us she was in Pain. We went immediately, and I found her sitting in a great Chair by the Fire-side; I ask'd her if she was then in Pain, she answer'd no, but that she had some sharp Pains just before I came in: I then touch'd her, and in the *Vagina* perceiv'd with my Forefinger and Thumb somewhat like a piece of Skin; but being willing to know whether it came out of the *Uterus*, I passed my Finger on one side the said piece of Skin in the *Vagina* to find if there was any part of that Skin or Membrane yet remaining within the *Uterus*, but perceiving the *Os Uteri* close, as before, and in the same Form as I left it last, I presently took out what lay in the *Vagina*, and upon examining it, confess I was much surpriz'd, it appearing to me so like a piece of Hog's Bladder, that I was not able to form any other Judgment of it, as I then told Mr. *Howard*, Mr. *St. André*, Mr. *Limborch*, and all that were there present, assuring them that it was my Opinion that Membrane never came out of the *Uterus*.

The Woman, *Mary Toft*, from whom I had taken it, seemed much concern'd at what I said, and cry'd. I ask'd her the Reason of her crying, to which she gave me no Answer, but the Women about her said, it was because she supposed I thought her a Cheat.

I asked for a Hog's Bladder, and they presently brought one fresh blown up, which it seems they had in the House: This added to my Jealousy. Then I compared the Membrane which

I took from the Woman with the Hog's Bladder, and could perceive no Difference but in the Thickness, in which the Bladder something exceeded the Membrane; they had both the same strong *urinous* Smell peculiar to a Hog's Bladder. I still insisted I should not be satisfied as to that Affair, unless I received out of the *Uterus* itself a piece of Membrane of the same kind with that I had already taken from the *Vagina*.

Mr. *John Howard* and Mr. *St. André* bid me have a little Patience and I should soon be fully satisfied. I still urged the Similitude of the Membrane to a Hog's Bladder, requiring them to tell me what they themselves thought it did most resemble? Both of them agreed, nothing look'd more like a Hog's Bladder than it did; and Mr. *St. André* added, that had he not actually deliver'd the Woman of part of a Rabbet from the very *Uterus* itself, this Circumstance would also induce him to believe the whole a Fraud.

The same Evening *Mary Toft* had several Pains like Labour-pains while I sat before her, which I believe was full three Hours, and I was all that time in expectation of receiving something from her *Uterus;* the Pains were sometimes very pressing, and the *Os Uteri* seem'd to prepare for opening, but they went off again suddenly.

When we return'd from the Woman to the *White Hart*, I told them again, that the more I considered the thing, the more strongly I was convinced, that the Membrane I took from the Woman had never been in the *Uterus*, but was really a piece of Hog's Bladder artfully conveyed into the *Vagina*.

Upon this, very warm Disputes arose amongst us, and Mr. *St. André* urged it was not more surprising, than that Rabbets should come from her *Uterus;* adding, that he was convinced of *that Truth* by examining the Rabbet he had taken from her *Uterus;* which at the same time had the exact external Appearance of Animals, like such Creatures as must inevitably undergo the Changes that happen to adult Animals by Food and Air; and that they carried within them the strongest Marks of *Fœtus's*, even by such Parts as cannot exist in an Adult, and without which a *Fœtus* cannot possibly be supposed to live, or to that effect. This he thought prov'd, in the strongest Terms possible, that these Animals were of a particular kind, and not bred in a natural way, saying, Why therefore might not this Membrane which looks like a Hog's Bladder, come also out of the *Uterus?* from whence he verily believed that it did, and that it might be part of the *Chorion;* to which Mr. *Howard* and Mr. *Limborch* assented.

After this Dispute, and at their joint Desire, I determin'd to make no publick Mention of this Affair till I had seen the Event of the whole Transaction, or had fresh Reason to suspect a Fraud, lest by such an Alarm I should rather obstruct than forward the finding out the Truth: I then mark'd the Membrane which I took from the Vagina, by cutting a small part of it, which I brought with me to *London.*

Tuesday the 29th, we brought *Mary Toft* to *London* with us, and lodg'd her at Mr. *Lacy's* Bagnio in *Leicester Fields:* I sat up with her all that Night; she often had the Motion on the Right side of her Belly, and sometimes very strongly.

Wednesday the 30th, the Motion was more faint, and she pass'd the Night tolerably well. Some time that Day I told Dr. *Douglass* what I had observ'd at *Guilford,* and took out of my Pocket-Book the piece of Membrane which I called a piece of Hog's Bladder, and shew'd it him, and ask'd his Opinion; he said it look'd like a piece of Hog's Bladder, and added, Surely this must be a Cheat, or to that effect: The same Day I told the Story of the Hog's Bladder to his Grace the Duke of *Richmond,* Duke of *Montague,* Lord *Baltimore,* and Mr. *Molyneux,* but did not declare it publickly for the Reasons I have given.

Thursday the 1st Instant, about ten in the Morning, the Motion was very languid, and having intermitted for a while, she was seiz'd with Pains like those of Labour: I then prepared, as before at *Guilford,* to deliver her; and having diligently search'd the *Vagina,* I found it clear, and received a Pain or two, which were strong and exactly like Labour-Pains: Upon this I desired Dr. *Douglass,* who was then present, that *he* would please likewise to examine her, and openly declare his Opinion, which he did, and in the hearing of several Persons of Distinction, profess'd that he found the *Vagina* clear, and was of Opinion the Pains were of the same Nature with Labour-Pains. I then took my Place again, and received more Pains of the like Nature, and perceiv'd the *Os Uteri* to spread a little and grow softer, her Face also flush'd and her Pulse was rais'd, as it always was whenever she had those Pains upon her.

After some time the Motion on the right side of her Belly, which they call'd the leaping up of the Rabbet, begun again, and those Pains like Labour-Pains went suddenly off; her Pulse soon became calm as before, and the flushing of her Face disappeared; she pass'd the remainder of the Day indifferently well, having for the most part the Motion on the right side of her Belly, which I never observ'd had any Influence on her Pulse; her Diet was Beef, Rabbet, Red-Herring, and such like: That Night she slept very well.

Friday the 2nd Instant, she had the Motion the greatest part of the Day, towards Evening it increased extremely, insomuch that she fell into violent Convulsions, which I never before observ'd in her, with frequent Contractions of the Fingers, rolling of her Eyes, and great Risings in her Stomach and Belly: During the Fit she would often make a whining Noise, and at Intervals be more than ordinary faint. She continued in her Fit near two Hours, for some Minutes I could scarcely perceive she had any Pulse; when she came out of her Fit, she perceived herself very weak for some time, and when I ask'd her if she remembered she had been in a Fit, she answer'd, No; she rested well that Night.

On *Saturday* the 3d in the Morning she was brisk, and all that Day had the Motion by Intervals; towards Evening she had another Convulsion Fit, though not so violent as the former; this Night she was very restless, and sometimes convulsed, had a Difficulty in making Water, and the Motion in her Belly was very little.

On *Sunday* the 4th Instant, about Eleven of the Clock in the Morning, Dr. *Douglass* and my self did carefully examine her Belly, when we perceived a Swelling a little above the *Os Pubis*, such as we had never felt there before, it was long, and, as we apprehended in the Cavity of the *Uterus*, which we observ'd had little or no Motion, this we could not account for; we each of us examined the *Vagina*, and found it clear as before, the *Os Uteri* soft and spread, as on *Thursday* last, but something more relax'd.

About Three in the Afternoon, the Pains, like Labour-Pains came on again; I touch'd her as before, and Dr. *Douglass*, Dr. *Mowbray*, Mr. *Limborch* the *German* Surgeon and Man Midwife, who were then present, did the same; and we agreed, that the Nature of the Pains were such, and so violent, as we apprehended something would soon issue from the *Uterus;* and this we declared in the hearing of many Persons of Distinction, who were then present: And I well remember, the Room being very full, I desired if there was any Person present willing to examine her, that they would do it then while her Pains were upon her. Accordingly, several Persons did examine her, and declared to the same Purpose: After having received several Pains, they, together with the other Symptoms of approaching Labour, vanished on the sudden, as formerly.

In the Evening, *Thomas Howard*, Porter to Mr. *Lacy's Bagnio*, made an Information against *Mary Toft*, before Sir *Thomas Clarges*, Bart. one of His Majesty's Justices of Peace, concerning a Rabbet she had clandestinely procured by his Assistance; upon which she was taken into Custody, and strictly examined by Sir *Thomas:* She very obstinately denied all the Porter had sworn; but her Sister, who nurs'd her, being examined to the said Fact upon Oath, acknowledged the procuring of the Rabbet in a clandestine manner; but that it was not designed for the Use we suspected, but for eating only.

Soon after *Mary Toft* confess'd she had procured the Rabbet, according to the Porter's Deposition, but that it was her Intention to eat it, she having *long'd* for it, and most obstinately persisted that she was still big with a Rabbet.

The same Evening I examined her again, and her *Uterus* appear'd to me to contain something of Substance in it; whereupon I earnestly press'd Sir *Thomas Clarges* that she might not be sent to Prison that Night, being still apprehensive there might something come from her *Uterus* in a little time; and, as the Fraud was not fully detected, I judg'd it might prove of very ill Consequence to remove her till the whole was found out.

On *Monday* the 5th, I gave my Opinion to Sir *Thomas*, concerning *Mary Toft;* and, lest he should commit her to Prison, I spoke to several Persons of Distinction, and that Day wrote to the Honourable Mr. *Molyneux* to assist me in that Affair, well knowing how industrious they had always been, in endeavouring to find out this supposed Fraud; for I believ'd a sudden Commitment of her to Prison, before the Cheat did manifestly appear, would be a means of preventing a Discovery: The Copy of my said Letter is as follows:

To the Hon. Mr. Molyneux.

Dear Sir,

"I Have, since I left you, very maturely considered what "you said this Morning, and the Contents of the Letter frank'd "by Lord *Onslow*, which you also shewed us, importing the "Discovery of a Fraud in the Affair in the Country; and adding, "*that*, to what happen'd to my self at *Guilford*, in relation to "my taking away from the *Vagina* of *Mary Toft* the *Godalming*

"Woman, what I call the Piece of Hog's Bladder, and the "Deposition about the Rabbet last *Sunday* Night, which I "heard *Thomas Howard*, the Porter of *Lacy's* Bagnio, make "before Sir *Thomas Clarges*, in the Presence of several Persons of "Quality, and the Unnaturalness of the Production, supposed "to have been; all this, I say, laid together, is to me such Evi-"dence of *Roguery*, as makes me strongly believe the whole to "be a Fraud. Therefore, that our Endeavours fully to detect "the Cheat may prove most effectual, and the unnatural Impos-"ture may most clearly appear to the Publick, I think *Mary* "*Toft* should by no means be sent to Prison, till the Truth "comes out; but that she should rather be kept, and most "strictly watched in some private House, where all Persons, "those of the Faculty especially, may have free and convenient "Access to her, which a Prison will not so well afford, till the "Matter be as plainly and fully detected as possible; for which "Purpose, I will wait upon Sir *Thomas Clarges* to take measures "accordingly; and, if you will give Leave, will call on you as "I come from him, to acquaint you with our Resolutions.

I am,
Sir
Your most humble Servant,
Dec. 6, 1726. R. Manningham.

After some Difficulty, I prevailed with Sir *Thomas Clarges* to let her remain in the Custody of the *High Constable* of *Westminster*, at Mr. *Lacy's* Bagnio, till the Cheat should be found out, or at least for a few Days longer; to which he agreed.

On *Tuesday* the 6th, Sir *Thomas* threaten'd her severely, and began to appear the most properest Physician in her Case, and his Remedies took Place, and seem'd to promise a perfect Cure; for we heard no more of her former Labour-like Pains.

I urged her very much to confess the Truth; and told her, I believ'd her to be an Impostor, and that she was differently form'd from other Women, having some peculiar way of conveying Pieces of Rabbets into her *Uterus*, and of imposing upon the World by her Motions and Pains, and therefore I resolved to try a very painful Experiment upon her, and was accordingly prepared for that Purpose; whereas if she would ingeniously confess the whole Truth, I would speak to several of the Nobility in her Behalf, some of whom then present promised her their good Offices on the like Condition.

I assured her also there was no Time left for Delay; and if she would not confess, I should immediately proceed to the Operation.

These Threats made great Impressions upon her, and being withal in a most particular manner exhorted by his Grace the Duke of *Montague*, Lord *Baltimore*, Dr. *Douglass*, and myself, to make a free and open Confession, before it should be done by any other Person in the Country, and to avoid so terrible an Operation; she at last begg'd very heartily to be let alone till the next Morning, and if she did not then confess, I might proceed then as I pleased.

Accordingly on *Wednesday December* 7, in the Morning, in the Presence of the two Noblemen before mentioned, Dr. *Douglass* and myself, she began her Confession of the Fraud; and in her Confession she own'd, That upon her miscarrying she was seiz'd with violent Floodings, and the Womb as then as she thought open as if she had been just deliver'd of a full-grown Child, she did verily believe one of her wicked Accomplices did then convey into her Womb part of the Monster (as she calls it) being the Claws and body of a Cat, and the head of a Rabbet; this put her to much Pain; After that time she believed nothing was ever put into her Womb, but into the Passage only, by the Advice of a Woman Accomplice whom she has not yet nam'd, and who told her she had now no Occasion to work for her Living as formerly, for she would put her into a Way of getting a very good Livelihood, and promised continually to supply her with Rabbets, and should therefore expect part of the Gain, or to that effect. *Mary Toft* asked what way that was. The Woman told her she must put up her Body so many pieces of Rabbets as would make up the Number of Rabbets which a Doe Rabbet usually kindles at one time, otherwise she would be suspected. *Mary Toft* asked how many that was; the Woman told her, sometimes thirteen.

From that time *Mary Toft* did often, by the Assistance of that Woman, convey Parts of Rabbets into her Body, till at last she could do it by her self, as she had an Opportunity, and that she did continue so to do.

Now, by the constant Irritation of those extraneous Bodies, thus artfully convey'd into her *Vagina*, the whole *Uterus* suffer'd much, and became larger in Bulk than it ought to be in its natural State; and the Bones, and other Parts of those Rabbets, so convey'd into the *Vagina*, did often offend the Neck of the *Uterus*, which, together with artful Management of her self, did occasion those violent bearing-down Pains, which came on by Intervals, and very exactly counterfeited the true Labour-Pains. The Motions of her Belly were partly Artifice, and partly real Convulsions; for I have often observ'd some of the Motions in her soundest Sleep, and even since she has confess'd the Fraud, part of her Motions being involuntary.

Mary Toft owned there was nothing in her Passage, when I examined her, only that time when I took the Piece of Bladder from her, which she had put into her Body a little before I came to her, on *Monday* the 28th of *November*, 1726, about Eight in the Evening; and ever since that Time she was afraid to put any thing into her Body, because I had often told her, if I found twenty Rabbets at times in her Body, it would go for nothing with me; for I should never be convinced, unless I did take some Parts of Rabbets from out of the very Womb it self, which I was very well assured could never be put there by Art.

Dr. *Douglass*, who was so kind as to write down her Confession from her own Mouth, will I hope shortly oblige the World with it at large, when she has discover'd the whole.

Thus have I given a full and faithful Account of every material thing which occurred to me during my constant Attendance upon Mary Toft from *Monday*, the 28th of *November*, 1726, to December the 7th following, which I thought my self obliged to communicate to the World, as well for their Satisfaction, as the Justification of my own Conduct.

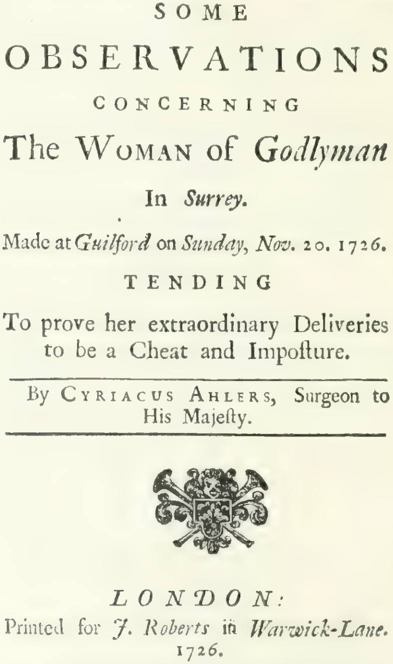
R. Manningham.

Decemb. 8,
1726.

DR. CYRIACUS AHLER'S OBSERVATIONS

PREFACE.

The following Sheets contain a short, and fair, Narrative of the Observations I made at *Guilford*, concerning the Woman of *Godlyman* in *Surrey*, whose uncommon Deliveries are now become the general Talk of the Town. It is drawn up with all possible Candour; and the Facts, whether seen or transacted by one, faithfully stated, and altogether agreeable to the Report I had the Honour to make to his Majesty immediately upon my Return from Thence. I had no Thoughts at first to appear with it in Print; but being call'd upon in so publick a manner, I could not, in justice to my own Reputation, deny that Gentleman as publick a Satisfaction. Let the Event of this Affair be what it will, I dare appeal to every judicious and impartial Reader to suspect a Fraud and Imposture, and whether I could not upon very good Grounds venture to declare it openly, as I will not deny to have done. I was very much surpriz'd to find, at the latter End of the Narrative publish'd by Mr. *St. André,* several Affidavits concerning me, and my Conduct at *Guilford;* None indeed tending to prove the Truth of what was attested in the Narrative itself, but all purely levell'd at my Character and Reputation. By the following Account, which I do here most solemnly declare to be true in every Particular, having asserted nothing therein, but what *I can take upon me,* and what I my self saw, heard, or transacted, it will appear, that it agrees in



SOME
OBSERVATIONS
CONCERNING
The WOMAN of *Godlyman*
In *Surrey.*
Made at *Guilford* on *Sunday*, *Nov.* 20. 1726.
TENDING
To prove her extraordinary Deliveries
to be a Cheat and Impoſture.

By CYRIACUS AHLERS, Surgeon to
His Majeſty.

LONDON:
Printed for *J. Roberts* in *Warwick-Lane.*
1726.

FIG. 2.—Title-page of Dr. Cyriacus Ahler's Book.

some Particulars with the Depositions mention'd above; but greatly differs in others. I must own, that it grieved me to find so many apparent Untruths therein swore to; several of which, for being too trifling, I forbear mentioning at present: But it is absolutely necessary that I should clear up two Points, upon which both the officious Gentlemen, who, out of a tender, though undeserved, Regard for the Vindication of my Character, were pleased to procure the Affidavits aforesaid, and to subjoin them to their Narrative, and upon which the Persons that swore to the Truth thereof seem to have laid the greatest Stress of their Evidence. These are, I. My telling Mr. *Tho. Howard*, That *I Extracted the Loins and Inferior Parts of the Rabbet,* which I brought away from *Mary Toft out of the Uterus.* II. My Refusal to *stay* at *Guilford, to take away the Rest of the Parts of the aforesaid Rabbet,* altho' *very much pressed* both by Mr. *J.* and Mr. *Tho. Howard.* As to the first of these two Points, which, in the Corrected Edition of the Narrative, was expressed in Capital Letters, it is so very absurd and ridiculous, that it scarce needs any Reply at all. Was I to grant, that I did make use of these very Expressions, which Mr. *Howard* swears *I* did, would it have done the Cause any good? Surely, it would be an inexcusable Presumption in me to imagine, that the Publick should believe a Thing, for no other Reason, but because I believ'd, and said so. I do not deny, but that at *Guilford* I behaved my self all along, like one who was perfectly satisfied of the matter: I had very good Reasons for so doing; and was not ashamed to own it upon my Return. But as to the Terms in Mr. *Howard's* Affidavit, I do aver, that I never so much as thought of them, till I found them in Print. Having had no manner of Reason, no private Views, nor indeed any Motive at all, that could induce me to disguise my Conduct, I flatter my self, that I shall be allow'd in justice, at least so much Credit and Belief, as Poeple can pretend to, who, when once concern'd in an Imposture, will venture every thing to go through with it. As to the second Point, My Refusal to stay at *Guilford,* till the Woman was deliver'd of the remaining Parts of the sixteenth Rabbet, Part whereof I had extracted in the Morning, this is something more material; and insinuates plainly, as if the Rabbet, which I brought to Town with me, and which I had the Honour to shew to his Majesty, and afterwards to several Persons of Note and Distinction, was not come away from the Woman during my Stay at *Guilford.* There being no Mention made of this Particular in the Evidence of the

Women, I will confine my self to the Affidavit of Mr. *John*, and Mr. *Tho. Howard.* I do suppose, in the first Place, that these two Gentlemen made proper Allowances, for that the Exclusion of Mr. *Brand*, whom Mr. *John Howard* would not suffer to come with me into the Patient's Room, depriv'd me of a proper Witness, to attest what past on both sides. This was most certainly a Hardship upon me, and beyond all doubt, done with some sinister View. The Intention of these Affidavits, and indeed the necessary Consequences, evidently tending to an indirect Accusation, not only of a gross Imposture, for which, were I guilty of it, I ought to be severely punished; but, moreover, of a notorious Breach of Faith to the King my Master, for which I should deservedly incur his utmost Displeasure, my Honour and Reputation call loudly for Redress and Satisfaction, which I shall endeavour to obtain in the most publick and ample manner. I could, indeed, in my own Defence, previously insist upon the very Improbability of the Thing; I could alledge the Character of a Man of Honesty and Probity, which I have hitherto bore, and hope to preserve among all those I have the Honour to be acquainted withal, and which hath made one not unworthy to be employ'd in his Majesty's Service; but I shall purposely avoid these, and the like Proofs, being able to produce others still stronger, to evince the contrary; I mean, the joint Evidence of Mr. *Brand*, who was with me at *Guilford*, and Mr. *Ziegler*, who lives with Mr. *Jagers* the King's Apothecary, and who are both ready to attest upon Oath, the first, that in his Presence, Mr. *Howard* inform'd me of the Delivery of the Head; that I begg'd and obtain'd it of him; that I put it up with the other Parts, and that I enquir'd after the Intestines and Feet: The second, that on *Tuesday* Evening he deliver'd a message to me from Mr. *Howard*, informing me of the Delivery of the seventeenth Rabbet, and requesting me to send back mine, being the sixteenth, according to Promise. After all, if my Endeavours have been any ways serviceable, to find out the Truth of this Matter, I shall think them well bestowed; and as to the rest, generously overlook the scandalous Aspersions, and malicious Insinuations of some Persons, of whom I had no reason to expect such Usage.

Cyriacus Ahlers.

POSTSCRIPT.

Monsieur *St. André* having asserted in his Narrative (pag. 20) that all the Facts, as by him there related, were verified before

His Majesty on *Saturday, Nov.* 26. Dr. *Steigerthal* and Dr. *Teissier* being present, I was desired by Dr. *Steigerthal*, to inform the Publick in his Name, that he all along suspected this whole Affair to be a Fraud and Imposture, and was far from thinking the comparative Anatomy, which is there mention'd by Mr. *St. André*, any ways satisfactory to verifie his Assertions.

Cyriacus Ahlers.

Decemb. 8, 1726.

Observations.

On *Saturday, Nov.* 19, 1726, I went, with his Majesty's Leave, to *Guilford*, there to enquire into the Condition of the Woman, who was said to have been delivered of fifteen Rabbets, and to inform my self of all the Circumstances of this uncommon Event, in order to make my Report to His Majesty. I set out that Afternoon at Four of the Clock, in Company with Mr. *Brand*, a Relation of Mr. Jager, the King's Apothecary. We lay at *Cobham*, and did not reach *Guilford* till *Sunday*, the 20th, at Ten in the Morning. We took out Lodgings at the *White-Hart*, where we did not stay above a quarter of an Hour: For the Drawer, who said, he was just come from Mr. *Howard*, informing us, that he was at Home, we went strait to his House. As we came in they told us, that he would be with us presently; but about half an Hour after they said, that he was gone to dress the Mayor of the Town. After we had been waiting full three quarters of an Hour, he at last came to us, dress'd in his Night-gown; and having been told by me, by whose Leave I came, and about what Business, he informed me in presence of Mr. *Brand*, that the Woman had been already delivered of fifteen Rabbets, and was just now fallen in Labour of a sixteenth.

We had been told at the Inn, that they heard Mr. *Howard* say, that the Rabbet had not been perceiv'd to leap, as it usually did, for about six Hours; but Mr. *Howard* himself assur'd us, that it had left off leaping ever since *Saturday* Ten of the Clock in the Morning, and that he presumed it must be dead since that Time.

Hereupon we went to the Woman's Lodging, which was over-against Mr. *Howard*'s House, who would not suffer my Companion to come into the Room where the Patient was, for fear, as he said, that too much Company should frighten her; for which Reason also he order'd the Nurse to see, that the Door might be well fasten'd, and to suffer no body to come in: Nevertheless, a little while after, several Women went in and out, as they pleased.

The Door being lock'd, the Nurse told us, that the Skin dropp'd down from her just now. Mr. *Howard* thereupon examin'd the Patient, whom we found sitting in a narrow Elbow-Chair. I was preparing to do the same; but was prevented by Mr. *Howard*, who said, he would let me know when it was convenient.

The Nurse, in the mean time, at our Desire, shew'd us the Skin, laid in a Bason. I touch'd it, and found it to feel something warm, a little moist round the Border; but every where else dry; and the Hair appeared smooth and even. Upon unfolding it, I could discern some small Blood-Vessels on the inside; but found not the least Drop of Blood, nor any Appearance of Water or Membranes. It smelt very fresh, like the Skin of a wild Ribbet, just stripp'd. I asked Mr. *Howard*, how it was possible for the Rabbet to have been thus stripp'd of its Skin in the Woman's Belly; to which he answered, He apprehended, that it must be owing to the violent Pression of the Womb against the *Os Pubis*. The Patient, who continued all the while sitting in her Elbow-Chair, with her Stays on, was now desired by Mr. *Howard* to walk a little about the Room. I found her Pulse very easy and quiet, without the least appearance of any feverish Disorder: There was little or no Swelling in her Belly, which, I must own, surpriz'd me very much. I likewise examined her Breasts, which I found relax'd, without any Hardness in the Glands, and no Milk in them; only upon squeezing, a little clear Serum came out, scarce enough to wet the tip of my Finger. I asked, whether the Swelling of her Belly had ever been greater: And was answered by the Nurse, That all along it had been much at one; only that sometimes a little Swelling was observ'd about the Stomach, which quickly disappeared again. I ask'd the Patient herself some Questions; but could obtain no Answers from her: And Mr. *Howard* said, he would take care to inform me fully of every Circumstance relating to her Case. I observ'd her with some Attention, as she was walking about the Room, and found that she press'd her Knees and Thighs close together, as if she was afraid something might drop down, which she did not care to lose.

Not long after she pretended to fall in Labour, and behaved herself in the following manner: She stood with her Knees close together against the Seat of an ordinary Chair, and holding the upper Part of it fast with her Hands, she began to squall and roar, and to move the upper Parts of her Body in a very strange Manner, twisting it from one side to another. I could not help wondering at her pressing her knees so close together, and not choosing rather to keep them asunder, to make way for the Birth; but doubtless she knew best, what Posture was the most advantageous for her singular Delivery.

Mr. *Howard* and I, in the mean time, conversing together, and the Discourse happening to turn upon Subjects, which made us laugh, the Patient laugh'd very heartily with us, which I thought so extraordinary for a Woman in her Condition, that I could not forbear looking at Mr. *Howard*, who, in her Excuse, told me, that she had an excellent Constitution, and did not matter her Labour-pains, as soon as they were over. Her Pulse continued all the while pretty easy and quiet, excepting only, that when she had been in Agitation for some time, it went a little quicker. She was now ordered by Mr. *Howard* to sit down again in her Elbow-Chair, upon which he examin'd her, and sat himself down opposite to her upon another Chair, in a Posture which appeared to me very uncommon, and indeed not a little Suspicious: He made her put her Legs between his, and with his Knees he press'd hers close together. There was a small Charcoal-fire lighted in the Room, and they were both sitting hard by the Chimney, after such a manner, that it was impossible for me to observe distinctly what they were doing, and in particular to mind the Motions of Mr. *Howard's* right Hand. It was now about a Quarter before Twelve, when the Woman fell into fresh Labour-pains, beginning a-new to cry out very strangely. Mr. *Howard* continued all the while to keep her knees close together; and holding his Head against hers, he took her Hands into his, whilst she stooping with her Head forwards, push'd her Back against the Back of the Chair with such Violence, that I was forc'd to hold the Chair to prevent its going over. She repeated the same afterwards at two or three different Times. Those Pains being gone off, Mr. *Howard* examin'd her again, and then suffer'd me to do the same, which accordingly I did. Upon touching her, I presently perceived some broken Bones, and advancing with my Finger, I discover'd a fleshy Body, which with the Bones stood a little way out of the Orifice of the *Vagina*. The *Vagina* was strongly contracted, closely embracing the Body, which presented itself, and which I conjectur'd to be the hind Part of a Rabbet, stripp'd of the Skin. The extreme Dryness of the Parts, the strong Contraction of the *Vagina*, and the Apprehension I was under, lest the Fore-Part should be in the same Condition with that I felt, made me proceed with some Caution, insomuch that I resolved rather to wait the Return of new Labour-pains, than by using any Violence, to tear and to injure the *Vagina*. Having retired for these Reasons, Mr. *Howard* ask'd me, whether I would not extract it; and upon my answering, No, he offered to make it easier for me, pretending that his Fingers were slenderer than mine: Accordingly he examined her, and presently desir'd me to touch her again, which I did, and found the Body above said advanced a little way; but when I laid hold of it, the *Vagina* contracted itself so strongly, that it snapp'd back again full the Breadth of a Finger. Upon this I would have desisted a second Time; but Mr. *Howard* observing it, urg'd me in strong Terms to proceed. So I took hold again, and to my surprize drew it out with all imaginable Ease. I found it to be only the hind Part of a Rabbet bent in a singular manner, and again without the least Drop of Blood, or any Moisture. I was in no small Surprize at what I had hitherto seen and transacted; and being previously told by Mr. *Howard*, that the Head and second Part were still behind, I would fain have examin'd her farther, to look for them; but Mr. *Howard* would not permit it, saying, That he would deliver her of what was left, himself; in order to which he sat himself down before her in the Posture above describ'd. I was very much startled at this; and the Woman soon falling into fresh Labour-pains, I very earnestly renew'd my Instances; telling him, that to search her now she was in Labour, would best enable me to judge what Condition the Womb and its Orifice were in, and where the remaining Parts of the Rabbet lay. But he remain'd constant in his Denial, and with a sudden high Colour in his Face, answer'd me, *By no Means;* alledging, that Mr. *St. André* himself had examin'd her but twice, and that therefore I ought to be satisfied with having extracted part of it my self.

By this Time I began to conceive a violent Suspicion of the whole Matter; but thought fit to conceal it, having resolv'd to behave my self all along, like one, who had no Reason to be dissatisfied. Nay, I feigned a great Compassion for the Woman's Case, which gave Mr. *Howard* an Opportunity to represent to me, that I could not but observe, what pains he must have been at, and still took, and what the poor Woman had suffered; and that he hoped His Majesty would be so gracious, when all was over, as to give them a Pension, there being many that had Pensions, who did not deserve them. I promised him, that I would not fail in my Report to His Majesty, to remember them in the best Manner I could. The Woman having, in the mean time, overcome another of her pretended Pains, Mr. *Howard* examin'd her a good while; when of a sudden starting and making an Outcry, he ask'd, *Did I hurt you?* And she answer'd, *Yes*. A little while after new Pains following, Mr. *Howard* said, he hop'd the remaining Part would now shortly present itself, wherein also he was not disappointed; for not long after he deliver'd her of it, and presented it to me. I found it to be the Fore-part of a Rabbet, looking a little redder than the hind Part, which I had brought away from her, otherwise without any Appearance of Blood and Water, something warm to the Touch, and smelling very fresh like a wild Rabbet, stripp'd of its Skin but a little while ago. There was nothing remaining but the Head, Intestines and Feet.

Much about this Time Mr. Howard was sent for to Dinner; but I desir'd that he would stay till the Woman was deliver'd of the remaining Parts, and then dine with me at the Inn, which he consented to.

This gave me an Opportunity of sending for my Companion, under pretext of ordering the Dinner; but when he came into the Room, I desired him in *High-German*, to mind what Posture both Mr. *Howard* and the Patient were in, being that above describ'd, and then gave him, in *English*, Orders, to provide a Dinner for us. Having all along express'd a great Concern for the Woman's Condition, Mr. *Howard* and she, after some other Pains, and before Delivery of the Head, laugh'd very heartily, as did also the Nurse; tho' I did not see that they had any Reason for so doing, unless it was to divert themselves with my feigned Compassion.

This Piece of Diversion, and some other Pains being over, Mr. *Howard* desir'd the Woman to lie down, which she did accordingly, and was then to all Appearance pretty easy.

About Two of the Clock I ask'd Mr. *Howard*, whether he would go to Dinner; but he said, it was time enough; and that if we staid a little longer she would be, perhaps, deliver'd of the Head.

About half an Hour after (during which Time, Mr. *Howard* sat by the Patient's Bed-side, and sometimes supported her Knees) perceiving, that the Head was not in any forwardness, we went to Dinner. At Dinner Mr. *Howard* told me, that the Woman was a great Lover of salt Beef, and that with my Leave he would send her some; accordingly she had a good Piece sent her, tho' it happen'd to be pretty Hard, and was very much salted.

We had not been long at Dinner when Mr. *Howard's* elder

Brother, whom I had seen before in the Patients' Room, came in. I desir'd him to sit down with us; and the Discourse quickly falling on the Woman's Case, I renew'd my Promises to remember them all in my Report to His Majesty. Soon after, Mr. *Howard*, Jun. being sent for, went away, saying, he would come again presently, leaving his Brother with me.

Altho' I at first intended to stay two or three Days, yet considering what had past, and reflecting in particular upon the repeated Denials of Mr. *Howard*, Jun. that I should not examine the Patient any more, I found that it would be to no purpose to continue there longer.

However, I still thought it best to conceal my Suspicion, and therefore complain'd of a violent Head-ach, which, I said, made me desirous to return to *London* with all possible Speed. Accordingly I order'd the Coach to be got ready. Mr. *Howard*, Sen. continuing to keep me Company at Table, I could not altogether forbear dropping a few Words of the Surprize I was in, with regard, in particular, to the Dryness of the Woman's Delivery, and the Unwillingness of his Brother to let me touch and examine her, after the Delivery of the hind Part of the Rabbet, which I extracted my self; but he answer'd, that he did not know what Reason his Brother had to deny me this Satisfaction.

Mr. *Howard*, Jun. not returning according to his Promise, I went straight to his House, with this Brother and Mr. *Brand;* but not finding him at Home, and being willing to give the Woman something, we went up all together to her Chamber, and found Mr. *Howard*, Jun. with her, who told me, as soon as we came into the Room, that he had just now deliver'd her of the Head; which he gave me to feel, it being pretty duskish, and as yet no Light in the Room. It felt warm and was a little Moist.

I forgot to mention, that before we went to Dinner, I desir'd Mr. *Howard* to let me take the Skin, with the Fore and Hind-part of the Rabbet, along with me, to shew them to His Majesty, which at first he would not consent to: But having promised him that I would take care to send them back again, he permitted me to take them, and so I put them up in an Ox's Bladder, which I had sent for, and turn'd the Inside out. I now beg'd likewise the Head of him, and put it up with the rest, in Presence of Mr. *Brand*, who was this Time suffer'd to come in.

I then told Mr. *Howard* of my Intention to return to *London*, and gave the Women something. But before I went away, I desir'd Mr. *Howard* to shew me some of the Things, which he had brought away from the Woman before. He produced several Pieces, which I look'd over in some haste, being unwilling to stay much longer. However, I ask'd what was become of the Stomach and smaller Guts, to which he answer'd, that he did not mind and preserve them. I likewise ask'd after the Guts and Feet of the Rabbet I was taking with me: To which he replied, that he fancy'd they were fallen to the Ground, and got under our Feet. He shew'd me among other Pieces, the Back of a pretty large Rabbet, wherein finding some Parts of the *Intestinum Rectum* remaining, with Pellets of hard Excrements in it, I desir'd he would let me have one; upon which he took one out with a Pin, and presented it to me in a Box, saying, that he had given the like to Mr. *St. André*, and Mr. *Molyneux*. He also read some Papers of his to me, concerning the Woman's Case, from the beginning of her Illness, which being pretty well known in Town, I did not much attend to. I took my leave of the two Brothers, and left *Guilford* about Five in the Evening, with Mr. *Brand*. We lay at *Cobham*, and came to Town on *Monday* about One of the Clock, when I repair'd forthwith to *Kensington*, to make my Report to His Majesty by Word of Mouth.

Before I proceed to the Description of the several Parts of the Rabbet which I took along with me, it may not be amiss to take Notice, that on *Tuesday* Evening, being at Mr. *Jager's* House, Mr. *Ziegler*, his Man, who had been at *Guilford* that Day, deliver'd a Message to me from Mr. *Howard*, to let me know, that since my Departure she had been deliver'd of another, and that he believ'd, she would have no more. He withal desir'd me, as soon as possible, to send back the Rabbet, according to my Promise; which I would have certainly done, if I had not receiv'd Commands not to part with it till further Orders.

For the Satisfaction of the Publick, I will here subjoin the Anatomical Description of the several Parts of the Sixteenth Rabbet, which I brought with me to Town.

The Skin, as it lay extended, was eight Inches long, and four and a half broad, where broadest, unequally torn with many Holes up and down, and several Pieces of Fat, particularly about the Extremities.

The Head was four Inches and a half long, from the Nose to the Extremity of the Ears, and cover'd with the Skin, all over, except a small Bit, which should have cover'd part of the lower Jaw, but was tore off.

The first *Vertebra* of the Neck was luxated, and the Muscles about it lacerated; but the third *Vertebra* was cut in the Middle; the transverse Processes between the first and third *Vertebra* broke off, with the Muscles round it, the Marks of a sharp Instrument appearing very plainly.

The Fore-part was two Inches three Quarters along the Backbone; there was some part of the Abdominal Muscles left, which I found ripp'd open lengthways: The *Diaphragm* was in its proper Situation, closing the Cavity of the *Thorax;* but I found it necessary to open it, to look for the Heart and Lungs, which I did in Presence of Dr. *Steigerthal.* I found the *Foramen Ovale* as yet open; and having took the Lungs out and laid them in Water, they swam on the Surface; there was some part of the *Œsophagus* left, most of the Ribs were broke along the Vertebræ of the Back on both Sides, and some of them in two Places, and the Muscles about the Fractures lacerated; the Ligaments of the *Vertebræ* were very much distended, and the *Spina Dorsi* itself broke in two Places. Some of the external Muscles were likewise tore, and the right *Scapula* a little separated from the Ribs; Part of the right Fore-leg was broke off, and the Remainder of the *Ulna* and *Radius* stood out in two large Shivers; the Muscles thereabouts were tore. On the left Side, the *Radius* and *Ulna* were entirely wanting, and even the lower Part of the *Os Humeri* cut off, with some sharp Instrument, as it appeared very plain.

Two of the false Ribs were left with the *Vertebræ* of the Loins, which were very visibly cut off from the first, with a sharp Instrument, and all the Ligaments of the Vertebræ very much relaxed, that it was no difficult matter to bend it; there was a good Part of the Abdominal Muscles left with this, and they had been cut transversely. All the Abdominal Contents were wanting, except the Urinary and Parts of Generation, with about two Inches of the *Intestinum Rectum.* I found several Pellets of hard Excrements, two of which I took out, in Presence of Mr. *Amyand,* and observ'd small Bits of Hay, Straw and Corn in them; some Fat appeared in several Parts; the *Tibia* of the right Hind-leg was cut off near the Articulation, with the Bones of the *Tarsus,* and a small Bit of the Skin was left there. There was likewise Part of the left Leg chopp'd off, just a-cross the Bones of the *Tarsus;* the Tail was entire, somewhat above two Inches long, and almost covered with the Skin.

Finis.

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

Thirty-eighth Annual Meeting, held at Washington, D. C., May 6, 7 and 8, 1913.

The President, HENRY C. COE, M. D., *in the Chair.*

After an address of welcome by G. BROWN MILLER, Washington, D. C., which was responded to by DR. J. RIDDLE GOFFE, New York City, the reading of papers was begun.

UTERINE INERTIA; ITS TREATMENT.

DR. GEORGE TUCKER HARRISON of Charlottsville, Virginia, stated that when the uterine muscle showed feebleness in the beginning of labor and during dilatation, this condition of atony was called primary uterine inertia. The cause might be due either to anatomical changes in the uterine muscle or in disturbed innervation.

Secondary inertia was a condition of exhaustion which came on from various causes during the period of expulsion. Before rupture of membranes in primary inertia, there was no indication for active intervention. After rupture, if there was danger to the life of the child from the discharge of liquor amnii or the mother's life was imperiled from the danger of septic infection, dilatation should be effected by the metreurynter (rubber bag); version followed by extraction to be then employed. In secondary inertia a too protracted labor was dangerous to the mother and child. Active intervention was indicated if the head was well down in the pelvis and resting upon the perineum, the forceps being applied. It had been recently proposed to perform Cesarean Section in certain cases of uterine inertia, especially in the interests of the mother. The obstetric resources at our command were amply adequate, and there was no indication for such operative procedure for inertia *per se*. In primary inertia a combination of morphin, atropin, and strychnin often had an excellent effect when given hypodermically. After dilatation pituitary extract had found favor with some obstetricians. Its exact field of application awaited further investigation.

UNDER WHAT CONDITIONS SHOULD UTERINE INERTIA BE TREATED BY ARTIFICIAL DELIVERY?

DR. EDWIN B. CRAGIN of New York City said that uterine inertia was often a source of danger both to mother and child—to the mother from the predisposition to hemorrhage and infection, with all their associated complications; to the child from interference with its placental circulation and from prolonged cerebral pressure. That an overtired uterus was apt to bleed after delivery, and that a woman who had had an intrapartum or postpartum hemorrhage ought to have a rise of temperature during her puerperium were facts well known to most obstetricians. It was also a fact which deserved recognition that a prolonged uterine inertia gave rise to an increased mortality and morbidity of the child, the latter of which might not be evidenced until later in childhood when impaired mentality showed the result of a cerebral hemorrhage at birth which, while it might have been caused by use of the forceps, was not infrequently caused by too great a delay in resorting to artificial delivery.

Uterine inertia was of greater importance in the second stage of labor, especially if the membranes were ruptured and the pressure of the uterus came directly upon the child than in the first stage, yet in several Cesarean sections performed during a prolonged first stage, the presence of meconium in the liquor amnii and the marked slowing of the fetal heart prior to the operation had convinced him of danger to the fetus from uterine inertia during the first stage of labor.

In considering the treatment of uterine inertia the author did not discuss that group of cases of inertia in which rest or the use of such drugs as strychnin, quinin, or pituitary extract sufficed to accomplish the desired result. The writer was free to admit that there were two classes of inertia. 1. Those cases in which the above-mentioned remedies were sufficient. 2. Those in which they would not accomplish the desired result.

He was further free to admit that since the introduction of the use of pituitary extract, the first class had been largely increased at the expense of the second, and many cases of easily rotating occipitoposterior positions had been changed by it to anterior positions and many cases of mild dystocia had been overcome.

The problem was to answer the question, under what conditions should uterine inertia be treated by artificial delivery? In general this question might be answered as follows, when either fetal life or maternal convalescence was in danger.

It would seem that by this time the importance of carefully noting the rapidity and quality of the fetal heart sounds during labor would be generally recognized, and this simple precaution be uniformly and frequently observed, yet among general physicians who practised obstetrics this was not the case. There was no criterion of the fetal wellbeing which equalled the character of the fetal heart sounds, yet this criterion was often neglected.

The need of frequent observations of the fetal heart sounds was in his judgment one of the deciding arguments in favor of the dorsal position of the woman in labor rather than the lateral position. The lateral position required frequent changes to the dorsal for proper auscultation and this meant frequent disarrangement of the sterile drapery. The dorsal position needed no such thing.

If examination disclosed the fact that a posterior position of the occiput was the cause of the delay and the embarrassment of the fetal circulation, artificial rotation and delivery was indicated.

In the presence of a slow, irregular fetal heart a dystocia of the hard parts indicated a Cesarean section unless this operation was contraindicated by the feeble condition of the fetal heart, the too long-delayed decision to deliver artificially, or the great probability that the woman was already infected.

Uterine inertia associated with fetal heart sounds indicating danger to fetal life was one of the first types of inertia indicating artificial delivery.

In a certain class of women with nervous system of unstable equilibrium, the nerve and muscle tone seemed only equal to the task of dilating the cervix, perhaps not even that. The immediate result was an exhausted woman, perhaps an hysterical woman, with labor only partly completed. If these patients were allowed to continue in their ineffective labor, the remote result might be a nervous and physical wreck for a year or two after the birth of the child. In a certain number of these cases simple measures, as rest, reassurance, strychnin or quinin, might overcome the difficulty, but in a large number these measures failed. This was the class and this the condition which usually indicated artificial delivery, usually by forceps, occasionally by version. This class had in recent months through the use of pituitary extract, been greatly reduced in the number of those needing artificial delivery, but there still remained a large number who should not be allowed to continue in labor for the two reasons already indicated: 1. The effect upon the maternal soft parts. 2. The effect upon her nervous system.

The exact type of mechanical assistance to be chosen depended upon the diagnosis of the conditions present. If the delay was caused by too great resistance in the bony canal and a disproportion between it and the fetal head, now was the time for Cesarean section rather than later after frequent manipulations had increased the mortality of the operation. If the inertia was due to too great resistance in the cervix, now was the time to make use of the valuable assistance of the elastic bag in both dilating the cervix and stimulating the contractions of the fundus.

If the presenting part had descended to the pelvic floor and resistance here had proven too great for the overworked uterus to overcome, now was the time for the use of the forceps before the maternal soft parts and the fetal brain received an undue amount of pressure.

His plea was for studied, skilled, artificial assistance in delivery before the mother and child were exposed to these dangers.

There was one condition not usually classed as uterine inertia which the writer would like to call attention to before closing. It was the long delay which sometime intervened between the rupture of the membranes and the uterine contractions of the first stage of labor. Patients sometimes presented themselves at the hospital with the history that their membranes ruptured three, four or even five days before their labor pains began. An unfortunate experience several years ago in which the fetal heart ceased before the labor was completed, and a study of the temperature charts of a number of these cases convinced him that in many particulars they resembled cases of uterine inertia during actual labor; that there was fetal danger from interference of fetal circulation from prolonged pressure and that maternal morbidity was common from sapremia if not from bacteriemia.

For these reasons the author had made it a rule in recent years both at the Sloane Hospital and in his private practice to introduce an elastic bag into the cervix if uterine contractions had not started at the end of twenty-four hours from the time of rupture of the membranes. The elastic bag, as a rule, not only brought on uterine contractions, but lessened the further escape of liquor amnii and the results both fetal and maternal had seemed to justify the procedure.

PITUITARY EXTRACT IF UREMIA INERTIA.*

DR. J. CLIFTON EDGAR of New York City presented this paper.

DISCUSSION.

DR. EDWARD P. DAVIS of Philadelphia stated that from the accumulated experience of the profession, it seemed that pituitary extract came into practical competition with strychnin, opium and ergot, and Dr. Edgar had given a valuable hint as to the danger of the extract. All would recognize the fact that in many cases opium to the point of lessening nervous excitability and securing rest was of the greatest value in bringing about the development of the physiology of labor, and we were all aware of the frequent experience of the unexpected and rapid delivery of a multipara to whom we had given opium to secure rest, and how frequently the woman surprised herself and us most of all when we were caught napping; but certain it was that opium in the general experience of the profession was the one sedative which was a stimulant to the ganglion which controlled the action of the uterus. It seemed to him that the difference between strychnin and pituitary extract was that strychnin given in moderate doses was a physiological stimulus to the ganglion supporting and maintaining uterine action, while pituitary extract was a matter of more brief and more stormy result, and hence was much more uncertain. He had not felt that he could substitute it for strychnin as a physiological stimulant or aid in labor. The use of ergot should be carried out with great caution, and he still adhered to the belief that ergot should be given on the emptied uterus only, and that in Cesarean section one might with advantage often lay aside ergot entirely. As an inducer and promoter of labor in connection with strychnin or pituitary extract, the dilating bag was of advantage over the bougie in that it decidedly stimulated the mucous secretion of the cervix and was less apt to alter the mechanism of labor.

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* For original article see page 20.

Dr. John O. Polak of Brooklyn, New York, said that no discussion of pituitary extract should go out without sounding a word of warning. He had had within the last three weeks a case of rupture of the uterus from its use. He had also seen within a month a woman who had such violent uterine contractions that an anesthetic and morphine had to be used to control the spasms of the uterus; consequently from his experience, which was comparatively limited, only seventy-six cases, he had come to the conclusion that pituitary extract had little or no place in the first stage of labor, and that it was dangerous unless there was absolute knowledge of the nature of the pelvis, particularly in outlet and borderline contractions. Furthermore, in order to secure the best results from pituitary extract we should have a dilated or, at least, dilatable cervix. It had no value in establishing uterine contraction, in emptying the uterus in cases of incomplete abortion. Another observation which he had made was that when it was used in the third stage of labor, secondary relaxation had been obtained in a sufficient number of cases to warn us that when used in the third stage it should be combined with ergot.

Dr. Henry T. Byford of Chicago said there was a mild form of inertia which in primiparæ meant a great deal, perhaps, in some cases owing to general exhaustion from muscular exercise of the prolonged first stage or want of rest and exhaustion of the nervous system. He had seen many cases in which there was inertia of the cervix. The patient had an irritable condition of the part and would have if the first stage of labor was unusual in its length. At one time, when investigating the function of the membranes in labor with a view of preserving them, he was in the habit of giving opium frequently; in those cases the administration of opium would afford rest, particularly as it acted in contrast to the advice so often given to women to go about and try to stimulate labor.

Dr. William E. Studdiford of New York City said that his experience had been much the same as that of Dr. Edgar. The pituitary extract was so uncertain in its action in the first stage of labor and so apt to cause bad results in the cervix that the cervix should either be dilated fully or be dilatable, which, was indeed, often the case; but when there was a positive diagnosis of no obstruction to rapid delivery, delivery could be brought about promptly. Therefore, the question of diagnosis was important in the management of these cases as well as in the indications for treatment. An accurate diagnosis should be made before any line of treatment was followed out.

Dr. Robert L. Dickinson of Brooklyn stated that as between foreign and American obstetrics there was one great distinction. Dr. Kerr read a very able paper before the Society on waiting or long delay in the second stage of labor. The German practice of infrequency in the use of the forceps as compared with American was most striking. The particular type of American woman, neurotic, easily tired from vigorous muscular exercise and anxiety, was a type to which pituitary extract applied. It was most fortunate to have had so lucid an exposition of the exact therapy of pituitary extract as Dr. Edgar had given, and all we could do was to further emphasize its limitations just as we knew when and where, or when and when not, to use ergot. As between the engaged head or completely dilated cervix and the place where one could safely put on low forceps, that was the important field for pituitary extract. If given hypodermically, we were sure of its action. It acted in from twenty to thirty minutes. Opium was dangerous to the child and pituitary extract had come to save the day.

Dr. Charles M. Green of Boston stated that the papers presented would be read by general practitioners and would have an influence on them, and in the subsequent discussion the idea should be advanced that much should obtain in the way of prevention of inertia. The attention of the general practitioner should be directed to the point that the time to begin to take charge of these cases of labor was when the women were two months pregnant, and if this were done, almost invariably that large class of cases of primary uterine inertia, largely due to general asthenia, to faulty condition of the uterus, would disappear. We should teach the average woman who had to have a baby just what a good athletic trainer would do in training men for a foot-ball team—train her for the condition, and if this were done we should see a large proportion of the cases of inertia disappear. Furthermore, there were a great many women who were much benefited during the latter part of pregnancy, say the last two months, by systematic treatment with iron, arsenic and strychnin. He gave strychnin in small doses to women in the last two months of pregnancy. If the woman was in pretty good shape, not too tired, with a fair nervous system, she would go through pretty well if she kept moving around.

Dr. J. Clarence Webster of Chicago stated that in cases of inertia associated with rigid cervix, elongated or hypertrophied cervix, he believed that the important measure of treatment was vaginal Cesarean section, not abdominal Cesarean section.

As regards pituitary extract, he had been using it at the Presbyterian Hospital, Chicago, and his experience was similar to that of Dr. Edgar.

Dr. Harrison, in closing the discussion on his part, stated that notwithstanding the field for Cesarean section, as exploited in Dr. Cragin's paper, he still adhered to the position taken in his own paper.

Dr. Edgar, in closing the discussion on his part, reminded the Fellows that the term pituitrin was a trade name, and when we were using that term we were using a commercial preparation.

Dr. Cragin, in closing the discussion, stated that he was free to admit the larger size Champtier de Ribes bag displacing the presenting part could change a good presentation into one less favorable. That was the reason he never used the largest size, No. 4, Champtier de Ribes bag, except in a breech presentation, or one which he desired to convert into a breech on account of the fear expressed by Dr. Davis. One objection to the bougie was that it was very apt to rupture the membranes early before the cervix was dilated.

THE INFANT PULMOTOR: ITS USE IN ASPHYXIA NEONATORUM.

Dr. Henry D. Fry of Washington, D. C., stated that the introduction of the infant pulmotor into obstetric practice was so recent that he had not been able to collect any statistics of the value of the apparatus. Certainly, it was vastly superior for resuscitation to the ordinary methods of artificial respiration. He had had no opportunity to test it in the serious form of asphyxia, the so-called asphyxia pallida, but in the livid form it had acted promptly and resuscitated the infant in about five minutes. Edgar had used the apparatus six or seven times in both asphyxia pallida and livida. The results were good, much better than he had anticipated, because, at first, he was doubtful of the value of the apparatus. A communication from Rochester reported the use of the pulmotor in five cases. In Case No. 2 it was unsuccessful. There was no heart action detected when the infant was born. In case No. 4 it was likewise unsuccessful, but there was no mention made of the heart action. In Case No. 1 the infant was born with marked asphyxia, but cardiac pulsations were detected. The labor had been prolonged, but was terminated by mid-forceps application. The infant had deformities of the extremities and had been born thirty minutes before the use of the pulmotor. The heart action was slow, 80 to 90 per minute. After forty to sixty minutes use of the pulmotor the infant breathed, but died two hours afterward. The condition of the infant suggested strongly the existence of intracranial pressure.

Efforts to resuscitate the infant should not be abandoned as long as there was any heart action.

DISCUSSION.

Dr. James Clifton Edgar of New York City stated that he thought he had the first infant Draeger pulmotor that came into this country. It was more than a year ago. At first, he looked upon the machine with more or less skepticism, thinking it was more of a plaything than anything else, but having used it for some time he found there was some value in it. They had one at the Manhattan Maternity which was ready for use in every operative case. They had had several cases which illustrated the value of the machine but, as Dr. Fry had said, the inspiratory force should not be run up to 25 centimeters. He thought 10 or 12 centimeters of force was sufficiently high. Although he had made no autopsies to prove it, he thought there was some likelihood of rupture of vessels when the inspiratory force was run up to more than 10 or 12 centimeters.

Dr. John O. Polak of Brooklyn asked if the pulmotor could be attached to the ordinary oxygen tank in case of emergency.

Dr. Fry replied that there was an extra attachment so that it could be put on an ordinary oxygen tank.

FACTORS IN THE FORMATION OF SKIN STRIATIONS DURING PREGNANCY.

Dr. Frederick J. Taussig of St. Louis, Missouri, pointed out that among the forty-seven women out of the sixty cases studied who showed striations, the distribution was as follows: striæ upon the breast only, one case; striæ upon the thigh only, two cases; striæ upon the abdomen only, eight cases; striæ upon the breast and abdomen, six cases; striæ upon the breast and thigh, eight cases; striæ upon the abdomen and thigh, nine cases; striæ upon the breast, abdomen and thigh, thirteen cases.

In general, therefore, it could be said that when striations did occur they were more often found at several points on the body.

The abdomen was the most frequent site. The totals were as follows: abdominal striæ, thirty-five times or 58 per cent.; thigh or buttock striæ, fifty-two times or 53 per cent.; breast striæ, twenty-nine times or 49 per cent; no striæ, thirteen times or 21.6 per cent.

As to the direction, size and exact location of these striations, his own investigation corresponded with those of others. In his record of each case, he made a rough sketch of the location of the striæ.

The majority of the sixty women examined could give very little definite information as to the time of the appearance of the first striæ. In seventeen women from whom a definite answer could be obtained the majority first noticed striations either upon the breast or in the hypogastric region, about the sixth or seventh month of pregnancy, but some times as early as the fifth month.

Some writers had stated that skin striations had been seen comparatively rarely among savage races, due probably to their practice of lubricating the skin with oil, and to the better hygiene of the skin where clothing was absent. How reliable these statements might be he had no means of verifying. While about one-third of his sixty patients were negresses he did not feel that the number was sufficient for a comparative study. It should also be remembered that striations were much less noticeable upon the skin of blacks than upon the skin of whites.

The obesity of the pregnant woman was also to some degree a factor in the formation of striæ. Grouping the women into those over 130 pounds in weight and those under 130 pounds, the heavy women showed nine cases of marked striation, and only one without striation, whereas the lighter women, those under 130 pounds, showed only three cases of marked striations, and three women without striations.

More important than the weight of the individual was the increase in weight during pregnancy. Here was found, particularly in breast and thigh striations, a very striking relationship to the increased deposit of fat in the skin.

A comparison of the twenty-nine women in whom breast striæ were present with the thirty-one women in whom they were absent, led to interesting conclusions. The women with striations stated in twenty-one of the twenty-nine cases that there had been a more than normal increase in the size of the breasts during pregnancy. In seven of the nine women in whom the breast striations were very marked, there was a history of a very decided increase in the size of the breasts. Contrast this with the other group. In twenty-one of the thirty-one women without striation, there was also no increase in the size of the breasts above the normal, in eight of the remaining only a slight increase above the normal, and only in two instances a very pronounced growth of the breasts.

Many factors come into play in the etiology of striæ about the abdomen. Age and increase in weight must be considered. Unusual size of the pregnant uterus, due to a large child, twins, or hydramnics, was an important factor. Of special interest was the influence of the corset. None of the women in his series wore binders. Six of them also wore no corsets at any time during pregnancy. The remainder wore a corset for varying periods of time from one month to the full nine months of gestation. In spite of the other factors coming into play, the influence of the corset could be definitely seen by the fact that the women with no striæ averaged six months wearing a corset, the women with slight abdominal striæ averaged 5.1 months wearing corsets, and the women with marked abdominal striæ averaged 4.9 months wearing a corset.

Special attention was paid to the condition of the abdominal walls after delivery. Relaxation of the abdominal walls might be said to be either the cause or the result of the striæ, or it might be said that the same causes produced both relaxation and striation. The last-named interpretation seemed the most plausible, but he could not get away from the idea that the abdominal muscles must undergo a certain amount of pressure atrophy when they were caught as in a vise, between a tense inelastic skin and an enlarging abdomen. Whatever be the correct interpretation, the study of his sixty cases showed a very definite relationship between marked striation and marked relaxation. Thirty four of the sixty women in his series had strong abdominal walls, postpartum, and only two of these showed marked abdominal striæ formation. None of the thirteen women who had no striation showed any abdominal relaxation. Out of ten women whose walls were greatly relaxed none were free of striations, and nine showed marked striation.

After mentioning the instructions which the author gives to his patients, he summarized as follows: only thirteen out of sixty primiparæ were free of skin striations. Skin striations occurred most frequently at several points and usually made their first appearance about the sixth or seventh month of gestation. In girls under twenty years of age they were decidedly more pronounced and more frequently found than in older women. Obesity, particularly a rapid increase in weight during pregnancy, predisposed to the formation of striæ, especially those about the breast and thighs. Lack of abdominal support during pregnancy, as in those who wore no corset, favored the formation of abdominal striæ. On the other hand, the tense and inelastic skin in which such striæ were found was to some extent a factor in subsequent abdominal relaxation.

At any rate, abdominal muscular relaxation and abdominal skin striation went hand in hand. Perineal tears had apparently no relationship to skin striation. Finally, the persistent employment of proper skin massage would, in the great majority of cases, prevent the formation of any but the slightest skin striations.

UTERINE CARCINOMA.

Dr. A. F. A. King of Washington, D. C., read a paper on this subject in which he reviewed the literature as to the various theories of cancer, and advanced another hypothesis as to its cause and prevention.

The etiological factors which his hypothesis required were (1) increased cell proliferation, produced by continued irritation, and (2) exposure of these proliferated tissues to the fertilizing influence of spermatozoa, to, in fact, what might be called "spermatic infection," which was no more frequently present than in the cervix uteri, and no part of the human body was more liable to cancer than this same cervix uteri, on which these two etiological factors so frequently exerted their combined influence.

THE MENACE OF CANCER.

Mr. Frederick L. Hoffman, Statistician of the Prudential Insurance Company of America, read a paper on this subject in which he summarized the results of his recent investigations as follows:

On the basis of trustworthy official data, it was safe to estimate the annual mortality from cancer in the United States at 75,000 and in the civilized world at half a million. The cancer death rate in the United States was increasing at the rate of 2 1/2 per cent. per annum, and a corresponding increase was taking place practically throughout the civilized world. The average age at death in cancer of all forms was fifty-nine years, or respectively 60.4 years for males and 58.2 for females. Cancer was largely a disease of adult life and of the total mortality from cancer 90.7 per cent. were deaths in people whose ages were forty and over. The male cancer death rate in the United States, with ages twenty-five and over, had increased 29 per cent. during the last decade, and the female cancer death rate had increased 20 per cent. On the basis of past experience the distribution of cancer deaths in the United States during 1913 would be about as follows: Cancer of the stomach and liver 30,105; cancer of the female generative organs 11,235; cancer of the rectum, intestines and peritoneum, 9,608; cancer of the breast 6,817; cancer of the mouth, tongue, etc., 2,880; cancer of the skin, 2,670; and cancers of other organs and parts 11,685. These statistics fully sustained the conclusion that cancer was a most serious menace to the American people, and that the tendency was toward a further increase in the mortality, regardless of the cancer deaths prevented by early surgical operation.

The cancer death rate of large American cities had increased from 37.2 per 100,000 of population during the five years ending with 1872, to 80.5 during the five years ending 1911. The cancer death rate of the City of New York had increased from 37.5 per 100,000 of population during the three years ending with 1872, to 81.4 during the five years ending with 1912. The corresponding increase in the cancer death rate of Philadelphia during the same period of time had been from 41.3 to 86.3. At ages of sixty and over in the state of Massachusetts, the mortality from cancer of the external organs for males had increased from a rate of 65.1 during the five years ending with 1905 to 92.5 during the five years ending with 1910. The corresponding increase for females with ages of sixty and over had been from 85.6 to 122.3. Aside from the observed increase in the mortality from cancer, there had been an increase from the mortality from biliary calculi in the registration area of the United States from 1.5 per 100,000 of population in 1900 to 3.0 in 1911.

All the facts available for the different sections of the country and the principal cities throughout the world sustained the conclusion, without qualification, that the menace of cancer was much more serious at the present time than it had been in the past. Since, as far as known, the disease was invariably fatal unless the cancer was removed in its entirety in the very early stages of the disease by qualified operative treatment, it was obviously of the utmost importance that the elementary facts concerning cancer should be better known and understood than was at present the case. The only hope for the patient lay in the earliest possible recognition of the symptoms of cancer, when operative treatment was a comparatively easy matter, with a practical certainty of success. Neglect, on the other hand, was absolutely certain to result in death from one of the most awful conceivable afflictions, summed up in the following descriptive statement by one of America's foremost surgeon's, who, himself, had saved a large number of valuable lives by early operative treatment.

"To relieve the horrible sufferings of prolonged nausea, the intolerable distress of continuous vomiting, the excruciating pangs of prolonged starvation, the terrible shock of constant pain, the keen distress of abdominal tension, the indescribable torture of protracted insomnia, the umparalleled agony of a living death, are all worthy of consideration."

The cancer problem, as thus stated, emphatically suggested the intelligent coordination of all possible agencies for the control of what had properly been called a national scourge and the deliberate reduction in the death rate of what was stated to be a preventable disease when subjected to early operative treatment. There was, therefore, urgent need of a national society for the study and prevention of cancer, and it was a gratifying fact that such a society was in course of formation. Looking back over the results which had been achieved through the nation-wide movement in the prevention of tuberculosis, there were strong reasons for believing that equally satisfactory results would, in course of time, be secured in the prevention of cancer.

Mr. Hoffman then presented the following recommendations to the society for consideration:

1. The organization of an American society for the study and prevention of cancer, primarily for the purpose of educating the public at large in the absolute necessity of operative treatment at the earliest indications of cancerous growth.

2. A thorough investigation into the geographical distribution of cancer throughout the western hemisphere, but with special reference to localities and sections which persistently show a very high or a very low rate of cancer mortality.

3. A thoroughly qualified medical and statistical investigation into the cancer experience data of general and cancer hospitals for a period of sufficient length to determine the precise results of medical and surgical treatment, with due regard to the after-lifetime, possible recurrence, or subsequent death of patients discharged as entirely cured or materially improved.

4. A nation-wide agitation for a material improvement and required completeness of the official returns of deaths from concer, with a due regard to the organs or parts affected, for the purpose of reducing the number and proportion of unclassified or ill-defined cancers to the lowest possible minimum.

5. The division of vital statistics of the census, as well as state and municipal boards of health in charge of the registration, tabulation, and analysis of vital statistics should be urged to redistribute the deaths occurring in institutions, according to the permanent or regular residence of the deceased. Only by means of such a correction can the true local incidence of cancer be established, as had been shown with admirable clearness by the investigations of Greene, of Edinburgh.

6. A thoroughly scientific investigation, through the cooperation of the census office, the Bureau of Labor, the Bureau of Mines, life insurance companies, etc., should be made into the occupational incidence of cancer, with regard to which there are reasons for believing that a wealth of useful information can be brought to light which is at present unavailable.

7. Since an erroneous diet is a probable causative factor in cancer occurrence, the nutrition of cancerous patients should be investigated in conformity to the strictly scientific and conclusive methods of Professors Atwater and Chittenden.

8. As an aid in the scientific study of cancer, and as a possible means of bringing about a more intelligent public understanding of the accepted facts of cancer occurrence, its nature and probable cure, the disease should be made reportable to the Board of Health in the same manner as other diseases which are a recognized menace to public health and welfare.

9. As a further aid, the Department of Agriculture should be requested to make a thorough study of the occurrence of cancer among domestic animals and plants known, or suspected, to be subject thereto, and such an investigation should, as far as practicable, be coordinated to the work of the Bureau of Soils.

10. The immediate preparation and widest possible distribution of a concise outline of accepted cancer facts, showing the disease in all cases to be of local origin, that the chief danger to the patient lies in the tendency toward a rapid extension of cancerous growths, that the only certain remedy known to science is the complete surgical removal of the affected parts at the earliest possible indication of

the disease, and that when this is done the outlook for a cure in the accepted sense of the term is decidedly helpful, but that to the contrary delay and neglect, or refusal to submit to operative treatment, are practically certain to result fatally within a comparatively short period of time.

EDUCATIONAL WORK IN CARCINOMA OF UTERUS.

DR. HOWARD C. TAYLOR of New York City stated that in considering any definite plan to undertake a campaign of education on the subject of carcinoma of the uterus it must be understood that it would involve a great deal of labor over a considerable period of time, running probably into years, and that the direct result might be difficult to see. It should be undertaken only with the conviction that it was the right thing to do, and with a willingness to continue it because of that belief even if the results were directly apparent the labor involved was such that there was probably no man or group of men engaged in the clinical practice of medicine who would have the time to devote to carrying it out, therefore, it must be done largely by others. It would, however, be necessary that the work should be carried on under definite medical supervision.

A campaign of education on the subject of cancer was not unlike the campaign of education that had been carried on during the past few years on the subject of tuberculosis, and we were fortunate in being able to profit by the experience gained in that work.

In educational work on tuberculosis there had been located in New York a controlling force which had had the general direction of the work, with a large number of subcommittees throughout the country. Free use had been made of the newspapers and magazines in the publication of articles and press bulletins. These articles and press bulletins were written largely from choice by laymen. These press bulletins were short articles of 100 to 500 words on the relationship of tuberculosis to some popular subject, as a news item and mailed to about 8,000 newspapers about every two weeks. There was in this a large amount of publicity at a comparatively small expense. Frequent use was also made of exhibits, lectures, circulars, etc. The subcommittees or local societies throughout the country assisted in local lectures and papers, distribution of literature, etc., under the direction of the central body.

If this work was undertaken there should be a central committee composed of rather a large number of men who would have a general direction of the work, general supervision of all literature. It would be necessary for this committee to employ on a fair salary some layman to take over the detail work of the movement, including writing of any articles to appear in the magazines and also such press bulletins as might be sent out to the newspapers throughout the country.

One of the first essentials in the early recognition of carcinoma of the uterus was the routine microscopic examination of tissue removed from every suspicious case. This microscopic examination of all tissue removed in any case should be within the reach of every woman and should be free to every woman who could not easily afford to pay for it. The Board of Health in New York and other cities had for years made without charge the bacteriological examinations necessary to positively diagnose or exclude diphtheria. It had furnished the necessary sterile tubes, established receiving stations, and made the collections in order to get all the doubtful cases by making it easy to both physician and patient. To accomplish this same end there should be an arrangement made for the free examination of all suspected tissue. The nature of this arrangement would vary in different places.

There were in this country no reliable statistics on carcinoma of the uterus.

The securing of accurate statistical information on cancer of the uterus in the United States should be an important function of this general committee, and to accomplish this the free examination of tissue should depend upon the willingness of the physician to keep the committee informed as to the course and outcome of the case. In this way accurate statistics, based on reliable examinations, would be obtained.

So far as the education of the people themselves was concerned, nothing would be more important than more careful education of all trained nurses. Every class graduating from a training school should have one or more lectures on the symptoms and the importance of the recognition of these symptoms in carcinoma of the uterus, because no class learned the symptoms from patients earlier than the nurses. If nurses knew the importance of irregular bleeding, we would get some cases earlier. In other countries the education of midwives on the subject of carcinoma of the uterus had brought very favorable results. While the results in this country were not so striking, certainly in our large cities such as New York, where the midwives delivered a very definite percentage of women and their influence among a certain class in the community was very definite, there was no question that much could be accomplished by more careful education of midwives as to symptoms of carcinoma of the uterus.

The local committees should be prepared to deliver lectures on the subject of carcinoma of the uterus and its early symptoms and the importance of early operation before any body of women who expressed the desire for such information. It might include women's clubs, school teachers, mothers' clubs and so on. In general the subcommittees should be ready to cooperate with the main central committee and carry out, in its own community, work done in other places by similar committees.

WHAT ARE THE BEST METHODS OF EDUCATING AMERICAN WOMEN CONCERNING CANCER?

DR. FREDERICK J. TAUSSIG of St. Louis, Missouri, stated that physicians should be the prime movers in the organization of such societies and must of necessity do practically all the work of instruction, but the control of this educational work had better, as in the case of tuberculosis, be left largely in the hands of the laity.

As to the exact manner in which this educational work was to be done, he divided the discussion into that of the written word and that of the spoken word. Each had its special scope and advantages.

It was almost impossible to have printed in a lay periodical intended for general distribution any article upon so distasteful a subject as cancer of the uterus. The only way it was to be done was to incorporate it in a general article on cancer and couch the special paragraphs referring to uterine cancer in such words as not to give offense. In spite of the wide circulation thus obtained through some of our women's magazines, he did not specially favor this method as its lack of directness tended to diminish its effectiveness.

There was a directness in knowledge acquired by word of mouth that ordinarily made it better retained; hence he believed much could be accomplished by lectures and personal conversation that mere printed matter failed to bring about. These lectures might be given either directly to the laity, before women's clubs, or social settlement organizations, or they might be given before groups of such persons as would be most frequently called upon for advice, such as nurses, midwives, teachers, social workers, ministers or druggists.

He would recommend that special stress be laid upon the early symptoms of breast and uterine cancer in the curriculum of all nurses' training schools and all colleges of midwifery. With the midwives, probably, not a great deal could be done in their present disorganized state. An important factor in the small number of early cases of uterine cancer we got in this country was doubtless the lower moral and intellectual condition of the midwife here. Winter in his last statistics reported an efficiency of 100 per cent. among the midwives of East Prussia; that was to say, not a single one had failed to recommend immediate examination and treatment in cases suggestive of cancer.

The most essential feature of this educational work was persistence. Winter could trace in a curve year by year from 1902 to 1912 the direct influence of interest or lack of interest upon the results obtained. The moment the work slackened a bit, the number of early cases diminished again. It was bound to be a long hard fight before we could hope for results, but he was convinced that results would come.

REPORT OF THE COMMITTEE ON WAYS AND MEANS IN THE MATTER OF IMPRESSING PHYSICIANS AND EDUCATING THE PUBLIC IN THE NECESSITY OF EARLY DIAGNOSIS AND OPERATION IN CANCER.

This committee, consisting of Drs. Howard C. Taylor, New York, Frederick J. Taussig, St. Louis, and Leroy Broun, New York, presented its report stating that little could be done of lasting value except through an organized body, the sole purpose of which was to conduct the needed campaign of education, of scientific assistance and collection of data. The committee further believed that such a society should be of national scope, embracing all interested societies and organizations together with lay people throughout America. That the work of the society should be carried on by a competent paid executive secretary and his office corps, under the guidance of a central committee of surgeons to be appointed by its Board of Directors. The need of such an organization and the possible good to be accomplished through its labor was presented to certain public-spirited women of New York City. Through their efforts and the hearty cooperation of the members of the American Gynecological Society together with prominent surgeons and lay people, a meeting was held in New York City. At this meeting the present needs and status of the cancer problem were presented in full before them.

At a later meeting of a committee on organization, consisting of laymen appointed by this body, the sum of $5,000 was guaranteed toward the expense of such a society for the first year. The committee was authorized not only to make a statement to the American Gynecological Society of this guarantee, but also to present the following resolution:

Whereas, at an informal meeting of surgeons and lay people called at the instigation of members of the American Gynecological Society residing in New York City to discuss the formation of a society to deal with the cancer problem, the Chairman was directed to appoint a committee on organization and we were thereafter appointed such committee, and,

Whereas, we believe that without the approval and active support of the medical profession of the entire country such an organization could not succeed, and we therefore wish to invite the help of the several branches of the Congress of American Physicians and Surgeons, be it

Resolved, that we request the American Gynecological Society to present the matter to each of the branches of the said Congress interested in the subject and ask such branches to appoint a committee of two or more members to cooperate with us in forming a national organization for educational and publicity work in the recognition and treatment of cancer, and that we meet with such committees as soon as may be after the meeting of the said Congress to be held during the week beginning May 4, 1913.

The resolution was signed by John E. Parsons, V. Everit Macy, James Speyer, Thomas W. Lamont, George C. Clark, Thomas M. Debevoise, Frederick L. Hoffman and Dr. Clement Cleveland.

This committee recommended endorsement and enthusiastic cooperation in the formation of such a national society.

The committee further recommended that the American Gynecological Society appoint committees of two each to present this resolution to such component societies of the Congress as it might deem interested in this matter, with a request for their cooperation.

It was moved, seconded and carried that the Committee on Education be continued indefinitely until further notice.

FURTHER REPORT OF CASES OF DYSMENORRHEA RELIEVED BY NASAL TREATMENT.

Dr. Joseph Brettauer of New York City stated that the cases observed numbered sixty-six in all and the results had been so favorable that the nasal treatment of certain forms of dysmenorrhea appeared to be an extremely valuable adjunct to the methods heretofore employed for the relief of menstrual pain. Of these sixty-six cases, thirty-three were immediately benefited; that is to say, the first period following treatment was painless; seventeen were immediately improved, the former suffering being greatly diminished; fifteen were not relieved at all.

On April 1, 1913, he made an effort to communicate with all patients treated since April 1910; in eighteen instances no report could be obtained, twenty-two patients reported that they were absolutely cured; some of these belonged to the early series treated in 1910 and early in 1911, giving a history of from twelve to twenty-four months of absolute relief. Seven of the older cases reported a vast improvement and only five, in addition to the fifteen which were not relieved immediately, reported no benefit.

Considering then, that in over half the patients treated, he was able to afford immediate relief, and that permanent relief was obtained in about one-third, doubt as to the value of the treatment was impossible.

As far as the class of cases was concerned, he would say that they were young women both married and single, for whom all the recognized means for the relief of dysmenorrhea had been previously employed, in some cases by him, but in the majority of instances by others and whose pelvic organs presented no organic lesions.

Of the many symptoms complained of, both previous to and during menstruation, one group stood out prominently; those characterized by premenstrual headache and nausea, and menstrual colic after the onset of the flow. In looking over his reports, he found that in most instances it was just this symptom-complex which was promptly relieved.

DISCUSSION.

Dr. Emil Mayer of New York City said that occasionally a young woman would come to his office with intranasal difficulty. Being interested in the question of painful menstruation, he elicited from some of them that they had suffered a great deal, and by treatment of the nasal conditions he was able to benefit them, so that his own statistics were more favorable than those of Dr. Brettauer, although he must say that he put his patients through a very severe test and did not accept his (the speaker's) conclusions until he had seen the patients themselves. As to amenorrhea, he had had several young girls who did not menstruate at all for three or four months, but after applications to the nose, menstruation became established.

Dr. E. C. Dudley of Chicago asked whether this cauterization treatment of the nose should be used in all cases in which there were neither pelvic nor nasal lesions?

DR. HENRY T. BYFORD, of Chicago stated that one of the chief objections he had to this method was the indefiniteness in regard to the kind of dysmenorrhea and the condition of the nose. As he understood, there had been no study made of the kind of dysmenorrhea to be helped. There were no lesions of the nose, except during the menstrual period, and they were usually regarded as a result, and not as a cause. When women had pain in the breasts every month, physicians did not treat the breasts, thinking that they would cure any disturbance in the pelvis. There were many kinds of dysmenorrhea, one of which had not been described, namely, nervous dysmenorrhea. He was willing to concede that the treatment outlined by the essayist would help patients who had this form of dysmenorrhea.

DR. ROBERT C. MYLES of New York City said he found many cases in which the central nervous system seemed to be in a state of aggravation or irritation as the result of a serious local irritation in the nose, with phenomena occurring in other parts of the body; and when the irritation in the nose was relieved, the other symptoms or phenomena disappeared.

DR. W. GILL WYLIE of New York City stated that after a long study of this subject he had come to the conclusion that in many of these cases the underlying cause was imperfect development of the lining membrane of the uterus. A peculiar case came under his observation not long ago. A mother brought her child to him. He asked her what the trouble was. She said that about the time of menstruation or when it was approaching her daughter could not appear in company, especially if there were gentlemen about, because suddenly her lips became so large and her face so red that she felt very uncomfortable and uneasy. On examination he found little or no abnormal changes in the vulva, except that the girl was not fully developed. He did not detect any gross disease, but he noticed that the secretions about the vulva became very profuse. He found that in women in whom a erotic feeling developed or arose when the cervix uteri or the condition of the uterus was being examined, marked changes in the erectile tissue would be found.

DR. BRETTAUER, in closing the discussion and in answer to Dr. Dudley's question, stated that we should by all means treat the nose in the absence of any pathological condition in the nose and in the pelvis. He would do so as an experiment, as it could do no harm.

(*To be continued.*)

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of March 11, 1913.

The President, GEORGE GRAY WARD, M. D., *in the Chair.*

DR. FRANK reported a case of

MYOMECTOMY FOR NECROTIC FIBROID DURING THE FOURTH MONTH OF PREGNANCY: NORMAL LABOR: PYELITIS POSTPARTUM.

The patient is thirty-two years old and married one year. Three years ago he performed a Dudley trachelorrhaphy for severe dysmenorrhea. The date of last menstruation was April 20, 1912. She was seen when two and one-half months pregnant, the local findings proving normal except for a fibroid felt in the right anterior uterine wall just above the cervix, about the size of a small lemon. The lower pole of the right kidney was found somewhat tender. Nausea and vomiting of pregnancy were severe. The urine, examined every two weeks, was normal. The pregnancy progressed normally to the end of the fourth month. Then, August 22, the patient had a sudden onset of acute abdominal pain sharply localized on the right side, accompanied by intense pain with each urination (no frequency, urine normal), repeated vomiting, but no rise of temperature. The uterus extended to within one inch of the umbilicus; the cervix was closed. The fibroid was intensely tender on palpitation. Although the temperature did not rise above 100°, the pain and tenderness increased to such a degree that operation appeared to be imperatively indicated. Dr. Sam. Brickner, who saw the case in consultation, fully concurred. Through a median suprapubic incision the uterus was exposed but not lifted out of the abdomen. Just at the reflection of the bladder peritoneum on the right side a sessile fibroid, the size of a large lemon, was noted. The peritoneum covering the growth appeared injected and had formed numerous fine, recent adhesions with the neighboring parts. The adnexa and appendix proved normal. The bladder was liberated by incising the peritoneum, the capsule of the fibroid opened in a vertical direction, and the growth shelled out. In so doing the mucosa at the junction of corpus and cervix was laid bare. A three-layer suture of the uterine muscle with chromic catgut was applied and the bladder peritoneum utilized to cover the suture line. The convalescence proved afebrile and uneventful.

The tumor was a fibromyoma, succulent and deeply red. In its center it showed areas of necrosis and softening.

The patient reached term without further mishap. Labor set in three days after the predicted date and began with rupture of the membranes. With each pain the patient complained of a "tearing sensation" on the right side at the site of the uterine incision. This pain she described as quite different from the uterine contractions and intensely dolorous. After fifteen hours of labor with weak pains, the cervix was three-fourth dilated, the head above the brim in R. O. A., the mother exhausted. The pelvis was very roomy and no disproportion existed, therefore, after all preparations for forceps delivery had been made 1 c.c. of pituitrin was injected hypodermically. The next pain was unchanged, but the second pain after the injection was very strong and sufficed to drive the head down to the perineum. An 8-pound child was delivered spontaneously. The placenta followed after fifteen minutes; a slight tear of the fourchet was sutured. The puerperium was entirely afebrile for twelve days. With each after pain the pain in the right side recurred for the first three days after labor, and then slowly abated, entirely disappearing by the seventh day.

On the twelfth day the patient experienced a chilly sensation, the temperature rose to 103.6°, the pulse to 120. Physical examination proved negative, except that the lower pole of the right kidney was tender and the entire kidney enlarged. The uterus was well involuted for twelve days postpartum, the adnexa and pelvic connective tissues normal and the lochia scant and serous.

The further course is illustrated by the temperature chart which shows three high rises of temperature.

In each case it required forty-eight hours for the temperature to drop to the normal. With each rise the kidney became enlarged and tender, a slight chill was experienced and the leukocytes rose above 20,000. As the temperature dropped the urine contained much mucus, considerable pus (microscopically) and numerous large rounded fatty cells with nucleus excentrically situated. Two cultures from the urine were found sterile.

During the stage of fever the patient appeared very ill, was noisily delirious and required stimulation. Since the twenty-second day (it is now forty-two days postpartum) the temperature has remained normal, though the urine still contains mucus, and no further symptoms have appeared.

Dr. Frank reported this case not because of its extreme rarity, but because it well illustrates the numerous diagnostic difficulties which may be encountered when atypical conditions arise. Usually when fibroids undergo necrosis during pregnancy there is a distinct febrile reaction. Here there was none. The pain was so intense that he seriously considered ureteral colic due to calculus, but on examination the extreme tenderness was sharply localized to the growth and peritoneal friction was elicited over it. The postoperative course was gratifying. Ihm (*Samml. klin. Vort.*, Gyn. No. 24) has collected fifty-seven cases of fibroids necrosing during pregnancy. Of eighteen operated upon, fourteen continued to term.

The labor which had been anticipated with dread, because the deep scar was situated at the weakest and most exposed part of the uterus, passed off smoothly. Although the risk of injecting pituitrin was realized, the risk appeared preferable to other methods of interference.

Finally when the skies seemed serene, chills and fever developed.

The kidney enlargement and tenderness sufficed to differentiate the condition from a thrombo-phlebitic infection. The course of the pyelitis proved unusually mild and short if no further attacks develop. Very often puerperal pyelitis runs a severe and chronic course, and usually it is due to bacterial (coli) infection.

Dr. Brickner reported a case of

SUPPURATING FIBROID DUE TO A CRIMINAL ABORTION.

Referred by Dr. Van Orden, Feb. 5, 1913.

M. L., thirty-four years of age. Previous history of no importance, except that three years ago she had an abortion induced. For the past four years has noticed a gradually increasing growth of the abdomen.

Last regular menses ten weeks ago. When six weeks over her time, she consulted a midwife who "operated" upon her. This was followed by a slight flow for three days and considerable fever. She then began to have pain in the abdomen at first on the right then on the left side. Since this time, there have been constant fever and pain.

Examination.—Temperature, 101, pulse, 100. Abdomen irregularly enlarged. On the left, a hard, immovable mass, not sensitive, extends 2 inches above the umbilicus. This is separated by a deep sulcus from a mass on the right which is not so large but is exceedingly tender. Vaginal examination is unsatisfactory. The cervix was open and there was slight bleeding. The fundus could not be made out.

Diagnosis.—Multiple fibroids and incomplete abortion. Feb. 20. Operation. When the abdomen was opened, the greater omentum was found adherent to the masses which were fibroids. It could be peeled off so readily that it was decided to remove it this way rather than by ligation. In removing it from the right fibroid this was opened and about a quart of foul pus escaped, soiling the peritoneum and the wound. The omentum was now hastily ligated, the entire mass everted from the wound and a rapid supravaginal hysterectomy performed. Contrary to expectation and to his great surprise, the patient made an uninterrupted recovery, even the wound healing primarily. It is unfortunate that no culture media were at hand at the time of the operation, but the outcome plainly indicated that the pus must have been sterile.

The specimen shows a moderately enlarged uterus with two pedunculated fibroids above it. The larger one, to the left, is intact. The smaller one, to the right, has undergone necrosis. A direct connection exists between the uterus and the tumor on the right, and the intervention of the midwife was beyond doubt responsible for the infection of the tumor.

Dr. Boldt read reports of two cases:

TUBAL ABORTION, SIMULATING APPENDICITIS, WITH PYOSALPINX ON THE OPPOSITE SIDE.

Dr. Boldt presented an appendix and a blood clot, cylindrical in shape, partly extruded from the abdominal end of a right Fallopian tube, with the history that the patient is twenty-seven years old, she had two children, the last seven years ago; two abortions at the third month, the last one year ago. The menstrual history was entirely negative; she had not missed her menstrual period. During the past month she complained of pain in the right iliac fossa, of a dull character. There was tenderness upon pressure only over McBurney's point. The uterus was normal in size and in consistency and in normal position. The left Fallopian tube was somewhat distended but not particularly sensitive. The right adnexa seemed normal. There was moderate descensus of the posterior vaginal wall. The diagnosis was chronic appendicitis as the cause of the pain.

After repairing the pelvic floor, the abdomen was opened about an inch to the right of the median line, since it was his purpose to examine directly the left adnexa. It was then found that the abdominal end of the right Fallopian tube was considerably distended, and extruding from it there was a well-formed cylindrical bloodclot, nearly an inch in diameter and 1 1/2 inches in length. A very small quantity of dark blood was in the pelvic cavity. The distal end of the bloodclot was lightly adherent to the tip of the congested vermiform appendix. The part of the blood clot still in the tube was easily expressed from it, and the tube left in situ. The opposite tube, a pyosalpinx, here shown, was extirpated. This is the first time that Dr. Boldt have seen the combination of tubal gestation (tubal abortion) in connection with purulent salpingitis.

FIBROCYSTIC TUMOR OF THE RIGHT OVARY WITH TWISTED PEDICLE. PERITONITIS.

The patient had been ill for several days with pain in the lower abdomen and constipation which could not be overcome; the enemata which had been given returned clear. This, with coexisting evidence of peritonitis caused the diagnosis of intestinal obstruction by the attending physician. The examination showed the pelvis to be filled by a solid tumor which was immovable. Upon opening the abdomen the tumor was found to be ovarian, the lower part, one-third the size of the tumor, was solid, and the upper two-thirds was a single cyst. The tumor was twisted two and one-half times upon its pedicle, and the contents of the cyst were dark.

Uterus with carcinoma of the cervix removed by extended abdominal hysterectomy. The patient was forty-two years old. The woman was in shock for the first twenty-four hours subsequent to operation, but she rallied after several intravenous infusions, so that some hope for her was entertained. A few hours only was improvement present, and she again sank and died on the termination of the second day.

Discussion.

(*a*) Question by Dr. Ward.

Desire to know how long the operation took, and was told three hours.

(*b*) Dr. Grad.—I had a case, similiar to Dr. Boldt's in which

I operated after making a provisional diagnosis of acute appendicitis. On opening the abdomen I found free blood in the peritoneal cavity, and on washing it out, I observed that during manipulation I must have ruptured an ectopic. I removed both the appendix and the ectopic at the same time.

(*c*) DR. WYLIE.—I should like to ask Dr. Boldt for the history of his case. Did the woman have any constitutional symptoms, fever, etc.,? for I believe that it is impossible for pregnancy to occur with a pyosalpinx. May it not be possible that the woman had an abortion and then an ectopic?

(*d*) DR. BOLDT.—In reply to Dr. Wylie I would like to state that there was no evidence of pregnancy in this case. There was no abdominal tenderness, except over McBurney's point, and on vaginal examination, there was only a slight thickening of the left adnexa, and none of the right.

(*e*) DR. VINEBURG.—I have in mind a case where the outer two-thirds of the tube was pregnant and the inner third was distended like a hen's egg and filled with pus. In this connection it is rather interesting to contemplate the case of a twisted pedicle where no operation is performed; here, we seldom get an acute peritonitis resulting. It is often mild in type, goes on for from two to three years usually with one or several attacks. I can recall a large cyst opened by an operator who thought he was dealing with an inoperable subperitoneal cystic tumor, probably malignant. The large bowel stretched across the cyst, the fluid was withdrawn, and the tumor proved to be a dermoid. I operated, and found the tumor to be adherent to the omentum, but not to the intestine. Extensive work was necessary; the operation took a long time, but the patient made a rapid and uneventful recovery. I would like to ask Dr. Boldt whether his case was unquestionably an ectopic. (Answered in the affirmative.)

(*f*) DR. HUSSEY.—As regards pregnancy occurring in a pus-tube, I should like to state that I thought I once had such a case. The tubal mass was slightly larger than a walnut in size, the proximal end of the tube was thickened, and microscopically the appearance was that of an ectopic, but on microscopic examination, it proved to be hemorrhage into a pus-tube.

DR. HIRAM N. VINEBERG reported a case of

EXCISION OF THE ENTIRE RIGHT OVARIAN VEIN, PRESENTING SUPPURATIVE PERI-PHLEBITIS, TOGETHER WITH THE UTERUS PRESENTING GANGRENOUS ENDOMETRITIS AND REMAINS OF NECROTIC PLACENTAL TISSUE FOR STREPTOCOCCIC PUERPURAL SEPSIS. RECOVERY.

Mrs. K. G. was seen Jan. 3, 1913, in consultation with her attending physician. She was twenty-five years old, married five years, and had two children, the last delivery occurred five days before and was normal. The placenta came away, apparently, entire, with the aid of slight manual expression. The confinement was attended by a careful and capable man, who is thoroughly aseptic in his work. The perineum was slightly torn and was immediately sutured. On the night of Jan. 1, about forty-eight hours after delivery, the patient had a very severe chill, lasting two hours. The temperature next morning was 105, pulse 120.

Jan. 3, seen at 4.00 P. M. Temperature then, was 104, pulse 120. The tongue was coated with a heavy white fur, the abdomen considerably distended, but yielding readily to pressure, the parietes were thin and the coils of the intestines could readily be seen underneath the skin. The uterus well contracted, fundus midway between symphysis and the umbilicus. The skin perineum presented three silk sutures. These were removed and the exposed perineal wound looked quite healthy. The vagina was free of wounds or abrasions. With two fingers, the uterine cavity was explored and an irregular projection of considerable size was detected on the posterior wall, near the fundus. The advice was given to irrigate the uterus once with iodine solution, and, if there were no improvement at the end of twenty-four hours, to do a careful curettage. There was no improvement after the irrigation and a curettage was done. The patient seemed improved for the next twenty-four hours, but after that, the temperature and pulse ranged about the same as before the curettage.

On January 7, the ninth day after delivery, the patient was admitted into Mt. Sinai Hospital. Her condition was about the same as when first seen by me, excepting, that a resistance was felt in the right side of the abdomen, and the patient's mental condition was quite clear. There was a slight tendency to delirium. A blood count showed 22,800 leukocytes and 84 per cent. polynuclears. A blood cutlure taken at this time, proved, later, to be negative.

During the following three days, the usual treatment for puerperal sepsis was diligently carried out. The daily range of temperature was, from 98.6 to 104.6, pulse from 96 to 136. The delirium was very marked and, it was noted the patient was steadily losing ground, the pulse, while not more frequent, was losing in volume and in strength, and the visible mucous membranes were becoming markedly more pale. On the right side of the abdomen, a fusiform mass, extending high up, could be indistinctly palpated. A diagnosis was reached of thrombo-phlebitis of the right ovarian vein, with probable suppurating metritis. It was felt that, the only chance of the patient's recovery, lay in an operation for the excision of the affected vein and uterus. The operation was done on the night of January tenth, the twelfth day after delivery. Just prior to the operation, the patient went into a condition of catalepsy. She made no response, whatever, to any question, paid absolutely no heed to any request, and the extremities remained fixed in the various position they were placed. The peculiar nervous phenomena made such a deep impression upon the family physician and the house staff, that the proposed operation seemed, to them, like a forlorn hope.

On opening the abdomen, the right ovarian vein was seen as a hard mass, about the size of one's thumb, which with slightly diminished caliber, extended upward, apparently, as high as its entrance into the vena cava. An incision in the peritoneum over the vein was made, and the mass was very careful dissected from the surrounding structures. Some difficulty was encountered, in freeing the ureter, which was closely adherent to the affected vein. A ligature was then placed as high up as was feasible, around the vein. With the thermo-cautery the vein was cut through distal to the ligature. It was noted that the infiltration of the vein extended still higher up. Dissection was then extended upward until the point was reached, where the vein enters the vena cava. At this point, the vein seemed normal. A ligature was placed around it, right at the vena cava, and the distal portion of the vein was excised. Next, the uterus, together with the cervix and the infiltrated portion of the right broad ligament, was removed. On looking over the field of operation, it was seen that, in the dissection, necessary to free the affected vein, the appendix was, in some way, freed from its attachments to its mesentery. It was attached merely by its base to the cecum. It was, therefore, removed. The bed of the excised vein was sutured over with peritoneum, as well as one could and a strip of iodoform gauze was laid into it, the free end being carried into the vagina. Another strip of iodoform gauze was loosely placed in the pelvis, the end of which, was also carried into the vagina. The peritoneum and fascia of the abdominal wound were united by tier cat-gut sutures, and the skin brought together by adhesive strips.

The operation was difficult and took one and a half hours, but the patient withstood it remarkably well, the pulse being as good at the end of it, as at the beginning. On the following morning, the patient's mental condition was quite normal and remained so, afterward. She showed gradual improvement, and on the seventh day, after operation, the temperature and pulse were practically normal. There was superficial suppuration of the abdominal wound and, there was quite free discharge of pus into the vagina, evidently coming from the bed of the excised vein. The patient left the hospital three weeks after the operation, having been up and about for seven days. The abdominal wound was practically healed, but there was still a deep fistula in the right vaginal vault, leading up to the bed of the vein. The discharge from it, at this time, was very moderate. The fistulous track closed completely, about two weeks later.

The excised uterus measured 18 cm. in length, and 9 cm. in width, with a thickness of 3 cm. at the placental site. There was a large mass at the placental site of gangrenous, necrotic tissue and the remainder of the endometrium was in a condition of gangrenous endometritis. The myometrium showed moderate inflammatory changes, numerous streptococci were found pervading the endometrium and myometrium.

A microscopic examination of the excised vein showed that the infiltration was in the outer coats, but that the intima was free. The exudate was permeated with small abscess formation and was swarming with streptococci. There was, consequently, a peri-phlebitis without any thrombo-phlebitis. The infectious process must, therefore, have travelled along the lymphatics and not through the veinous channels, as one would have concluded from the macroscopic appearance of the lesion at the operation.

Dr. John Osborn Polak reported a case of

DYSTOPIC KIDNEY.

The history of the patient from whom this specimen was removed serves to illustrate: First, that dysmenorrhea may be due to ptoses of other organs than those belonging to the genital tract; second, that when the abdomen is opened a careful exploration of the several viscera may obviate repeated operations for the same symptoms.

S. B., an infant's nurse, aged twenty-seven, was referred to him because of persistent menstrual and intermenstrual pain in the left inguinal and lumbar regions. Puberty had occurred at thirteen, after which time the periods had recurred at intervals of four to six weeks, accompanied by pre- and co-menstrual pain in the left side and back.

In May, 1912, she was operated on in the Woman's Hospital for retroflexion and chronic appendicitis, at which time a suspension was made and the appendix removed. Her convalescence was uneventful. Her pain was relieved during her stay in the hospital, however, on resuming her duties all her old pain recurred, extending from the left lumbo-sacral region down the thigh, the pain was increased by walking.

On February 3, 1913, she presented herself for examination. The pelvis was normal and free from exudate but on recto-abdominal examination an ill-defined tumor, just at the left posterior edge of the pelvic brim could be made out. Abdominal pressure at this point excited exquisite pain. She was referred to the Jewish Hospital for observation. Oil enemata were given with the patient in the knee-chest position, these were repeated daily until we were assured that the signoid and descending colon had been thoroughly emptied; when another examination revealed a sensitive mass on the front of the left ilium, just above the pelvic brim.

On March 11, 1913, the abdomen was opened through a transverse incision and the peritoneal cavity explored, the uterus was held in antero-dextro-version by a suspensory ligament attached to the right posterior fundal surface, the ileum, cecum and sigmoid were adherent to one another and a retro-peritoneal mass, 9 by 10 cm. in size, lying on the ilium, just over the left synchondrosis was exposed by splitting the overlying peritoneum; this proved to be a small lobulated dystopic kidney. The ureter ran over its anterior face, the renal artery came off from the aorta, just above the bifurcation of the iliacs. The right kidney was palpated, found enlarged and in position. The left kidney fossa was empty. An attempt was made to replace the dystopic kidney but this was found to be impossible owing to the short vessels and ureter, the latter, measuring only 11 cm. A nephrectomy was decided upon and done. The posterior layer of peritoneum was closed with a running suture and the abdominal wound sutured in layers. Her condition at the conclusion of the operation was excellent.

DISCUSSION.

(*a*) DR. BISSELL.—I was delighted to hear a man with the great experience of Dr. Polak speaks on this point. The interesting feature in this case is the symptoms. We get positive pelvic symptoms from a displaced kidney, and I have repeatedly called attention to this fact in all my articles. Sufficient stress has never been laid on this point; it is an undoubted fact that a displaced kidney may give pain, dysmenorrhea, excessive flow and other pelvic symptoms. I recall three operations that I performed for supposed retroversions, and found that the trouble was due to a floating kidney. As regards Dr. Polak's case, the woman was referred to the Woman's Hospital, where her abdomen was opened for a supposed retroversion, and the trouble was not found. This winter I had a case of pyosalpinx which I wanted to show at the Clinical Congress. The woman mysteriously disappeared, and I want to inform Dr. Polak that in case she comes to him for operation, and is found to have a movable kidney, he should not censure me too severely.

I should like to know why the kidney in this particular case had to be removed?

(*b*) DR. POLAK.—In reply to Dr. Bissell, I desire to state, that the kidney could not be replaced, because the ureter was only 11 cm. in length. The renal vessels took origin from just above the bifurcation of the iliac, the veins were extremely foreshortened, and gave the greatest trouble. In conclusion, I should like to state, that whenever the abdomen is opened, it should be carefully explored, both intra- and extraperitoneally.

DR. HERMANN GRAD read a paper on

EPITHELIOMA OF THE VULVA AND CLITORIS.

Mrs. V., fifty-two years old, had been suffering with itching of the vulva for the past three years. The pruritus began about a year after her menopause. For the past three months she had been suffering with pain in the vulva and a swelling appeared which is painful on walking.

Inspection reveals a neoplastic formation located on the labia minora and also involving the clitoris. The labia minora had ulcerated through severing the lip into two parts. The parts also show unmistakable evidence of a kraurosis vulvæ. There is an atrophic condition of the vulva extending down to the meatus urinaris in the midline. The patient is also a victim of chronic Brights with a blood pressure of 210, a trace of albumin and a few casts.

Under a light chloroform narcosis the clitoris, both labia minora and vulval mucous membrane, were removed. The meatus urinaris had to be displaced by lowering it on the anterior wall of the vagina. The wound healed partly by primary union and partly by granulation.

The following is the report of the pathologist.

Macroscopical Examination.—Piece of skin including clitoris and labium., with ulcer in center. Ulcer shows papillated ground with irregular edges. No scab.

Microscopical Examination.—Sections show squamous epithelium which in one spot is invading submucous tissue. In advance of the invading area is a marked inflammatory reaction. The islands of squamous epithelium show no cornification. Mitosis is present.

DISCUSSION.

(*a*) Dr. Ward (Chairman).—I desire to call the attention of the gentlemen to the fact, that three days ago I operated on an epithelioma of the clitoris, and hope to be able to present the specimen at the next meeting.

(*b*) Dr. Vineberg.—Some time ago I had a case of kraurosis vulvæ which was extensively operated upon. The patient did well for two years, and then developed epithelioma of the clitoris. I also had a case lately of epithelioma of the clitoris, which we hope to present before you in the near future.

Dr. Rawls read a paper on

"STERILITY—TREATED BY THE INTRAUTERINE STEM."*

DISCUSSION.

Dr. Broun.—I feel that the paper just read is of great importance and brings out many practical points. In the majority of small uteri which are not pathologically flexed, I use the larger size Davenport stem. I keep this in through two periods, from six weeks to two months. When the Dudley operation was first brought out, it was used extensively under Dr. Cleaveland. There is one practical point not brought out to-night, which I would like to call your attention to. When the Reynold's operation was introduced, I combined it with the Dudley (as did Dr. Polak also). In performing the Reynold's operation, the cut is made at right angles to the canal, and then the sharp edges are approximated and the lips are brought together, but this prevents free drainage which is extremely desirable. I cut through with the knife so as to get a sharp edge and then in order to hold the cut open in the posterior portion of the canal, I introduced a stem, which by its presence works for itself a straight canal and thus meets all the necessary conditions. I believe that in the majority of cases the indication is fully met by the use of a large size stem.

Dr. Dickinson.—Anteflexion is usually infantilism, and can only be improved by improving the uterus. The Dudley operation is a poor remedial measure to say the least, for the trouble is at the internal os, and not at the external. The operation does not develop the flabby flexing angle, whereas, the stem does. The Dudley is at fault, for it misses the point; 1 1/2 inches of anterior vaginal wall must be lengthened to two inches, the operation thus resulting in a painful depressed scar, therefore, it should not be practised. I have here a report which I recently got together, to ascertain the good or ill effect gotten from the use of the intrauterine stem. I wrote to twenty-two married women, sixteen reported. Of these, nine had become pregnant, two of the remaining seven, failures being due to the fact that we had not then studied carefully the effects of excessive vaginal acidity. The main indication is to use a long large stem over a long period of time and for this purpose the Baldwin stem is the best—the others are too light, a twenty-two being the best; and it is faulty mechanics to place the wire where it will cut through at the most vascular point. It should be placed antero-posteriorly, thorough dilatation being eminently desirable, the old Palmer dilator being much better than the Goodell, the latter bending together at the tips. The Palmer is the only parallel dilator; it has shelf edges, and teeth hold the dilator from slippnig. You may try any dilator, gentlemen, except the Palmer, and see how the tips bend, for they do not seem to be able to put enough metal into them. In conclusion allow me to state that I do not know the Dudley-Reynold's operation, or else the stem is much better.

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* For original article see page 35.

Dr. Frank.—I do not believe in statistics as a rule, yet they are sometimes invaluable. They show that in dysmenorrhea, operation will cure 80 per cent. of the cases; whereas, in sterility, operation will only effect from 30 to 35 per cent. of cures. There is a disproportion here of 50 per cent., about one-half; a miserable percentage of cures as far as the ordinary run of operations goes. In 80 per cent. of the cases dysmenorrhea is uterine in origin; in one-third of the cases, sterility may be attributed to uterine causes; the other causes being below the internal os. As regards Dr. Dickinson's remarks on infantilism I believe the following comparison is justifiable. Infantilism means muscular atrophy and weakness, in a manner analogous to anterior poliomyelitis. The main cause is to be found in the ovaries, and although the uterus may react directly on the ovaries, the stem is but a crude measure with which to try and effect a cure, and furthermore, is only successful in 35 per cent. of the cases.

Dr. Wylie.—With the limited time at our command, all the causes of sterility cannot be taken up. In 1886, at Bellevue, the elder Syms used to operate and subsequently insert a stem. There was a slit through the instrument so as to give dilatation and provide drainage in the acute stage, a great advance over previous procedures. Then came the sponge tampons with its capillary attraction to take up fluid into the uterus.

Personally, I have never done any cutting operation for this condition, and my results, I may say, have been good. I think that operation for sterility will soon be discarded. Proper technic is the important thing to successfully carry out treatment by the stem, a proper stem must be used, thorough dilatation is essential, all details must be attended to, otherwise, we will fail signally in our results. We must not forget that in a good proportion, especially in married women, dysmenorrhea and sterility may be overcome by the use of the stem, therefore, one should not rush to operation. The uterus should be dilated about one week before the period comes on. The stem should be left in through one or two periods. Some of our men in Canada having even left them in for several months. The procedure is simple, and can be done without an anesthetic. Instrumentation for small undeveloped uteri is dangerous, and may even result in rupture. The dilatation should be done gradually, then the stem is inserted and should be kept in, using a retroversion pessary to keep the uterus at an acute angle to the vagina. Syms, when he had a long cervix with a bend, did not dilate beyond the bend, and then packed in with gauze, but the latter step is unnecessary if the previous ones are properly carried out.

Dr. Brickner.—We have eighty-five members in this society, and I believe there are eighty-five different opinions among us, on this topic. Just like in whooping-cough, the causes of sterility are not clear. In Germany the controversy centers about the fact as to whether the stenosis is at the internal or external os. It does not make any difference what operation is used as long as we have the apparent miracle of a cure. A woman is sterile for twelve years and in six weeks she suddenly becomes pregnant; the same is true for dysmenorrhea. Some causes of sterility are not sufficiently grasped. One point I must speak of in the Dudley operation. The most important factor, aside from the formation of the wedge-shaped pieces and the method of suturing, is that there must be complete and thorough dilatation of the cervix. I have seen operations where this has not been done. The cervix must be paralyzed so that the wedge may be easily cut and thorough dilatation must be practised, otherwise, the operative result will be nil.

Dr. Boldt.—Sterility and dysmenorrhea can only be relieved by stem or operation when due to mechanical causes. Thirty years ago I used to practise operation for sterility, but I am convinced that if thorough dilatation is not done, one does not know how far the bistoury will go. The instruments must go beyond the internal os, and should be carried almost directly to the peritoneal surface before dilatation is attempted, and then packing should be resorted to for two weeks, and then one can use a stem if one so desires. The eventual results, whether one uses the stem or operation, is about the same, namely, 25 to 35 per cent. of cures in sterility and 75 per cent. of cures in dysmenorrhea.

Dr. Vineberg.—A friend of mine who was married two years brought his wife to me for examination. I found a small anteflexed uterus and suggested one of the recognized operations. But as my patient was going abroad, the operation was on that account postponed until her return. She became pregnant on the steamer and has had six or seven children since; therefore, do not tell a woman that she cannot bear any children unless she is operated upon; simply state, that an operation may improve her condition. I would like to get an honest opinion from the gentlemen present as to whether they have seen any ill result to the patient, who goes about and wears her stem for a long time? If convinced to the contrary, I will adopt the same course of procedure.

DR. CAREY (Guest).—As mentioned by previous speakers, eight out of ten patients are cured of their dysmenorrhea, and 30 per cent., of their sterility. Three years ago I made a report of a number of these cases, and found that a certain proportion of the unrelieved ones were due to diseased spermatozoa. In examining the semen of the husbands of many of these women, the following was to be noted; either there was not enough spermatozoa present to be demonstrable, or else, there were a few sluggish spermatozoa which on being watched for one hour would show a cessation in their activity. The high power showed immature and deformed cells in a transitional stage of evolution, or the head and tail were lacking, or the head was attached at right angles to the tail, or the tail was attached laterally, or granular degeneration was to be noted in the tail, etc. Only two out of every ten spermatozoa showed activity.

In 100 cases I studied the chemical reaction of the vaginal secretions, and I found that the increased acidity of vaginal secretion is variable; rarely, is the cervical secretion acid. I performed an experiment in which I suspended spermatozoa in a medium which was slightly acidified with lactic acid, and soon there was a cessation of activity; increase in the alkalinity of the vaginal secretion had the same effect.

DR. OASTLER.—We have seen that we get approximately the same percentage of cures whether the stem or operation be used. It is my experience that simple dilatation relieves either by changing the circulation or interfering favorably with the terminal nerve supply. It may be that obstruction is no factor in the causation of dysmenorrhea or sterility. The spermatozoa and the ovum are small, and unless secondary endometritis ensues, there can be no obstruction, therefore, the latter does not seem to be a cause. We must look for something in common to which to attribute the good results obtained by the use of the stem or operation, and it has occurred to me that since many girls when married get well entirely, the improvement in circulation and in the nerve supply are the causative factors at work.

DR. GRAD.—In reply to Dr. Vineberg allow me to state, that Dr. Chambers inserts the stem, allows the patient to go home, wear it three to four months, and no ill results follow. When he has a hard and thick cervix with a pathological cystic degeneration, he amputates the cervix and then introduces the stem.

DR. HOLDEN.—In doing a dilatation it should be thorough, and the dilator should be given a rotatory movement so as to massage the cervical glands, and express the mucus within them. Then the incision should be made including the internal os, so that the thumb forceps can go up. With these points in mind, the maximum beneficial results will be obtained.

Dr. Rawls.—Neither the stem or the cutting operations will relieve every case of sterility. A certain percentage of failures, even in cases where these means seem indicated, are due to associated ovarian and tubal conditions which in themselves are a bar to fecundation. Further, the percentage of sterility would be reduced if one relieved the dysmenorrhea in the unmarried and thus prevented the saprophytic or infective endocervicitis which results after marriage. All stems act as drainage tubes and thus a grooved or hollowed form of stem is unnecessary. The posterior incision of the stricture is essential to the technic of the Dudley operation. This was pointed out in the original description of the operation and Wadsworth in 1904 in his report of cases used a similar method as reported here to-night.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OBSTETRICS AND GYNECOLOGY.

Meeting of February 27, 1913.

George Gray Ward, Jr., M. D., *in the Chair.*

SPINAL ANESTHESIA. A CASE OF ACUTE APPENDICITIS OPERATED ON FOUR DAYS AFTER LABOR. RECOVERY.*

Dr. Sidney D. Jacobson read this paper.

ADENOCARCINOMA OF THE OVARY COMPLICATING LABOR.

Dr. Sidney D. Jacobson reported the following case.

History.—S. K., a Roumanian by birth and only lately arrived in this country, aged twenty-two years and in the last month of pregnancy, was admitted to the hospital on September 21, 1910. According to the record, it appears that her family and personal history have no bearing on the case. That she had no illness and no venereal history. The vital organs appear normal, as are also her pelvic measurements except that it is emphasized that she has a very greatly distended abdomen which measures 55 inches at the level of the umbilicus. Slight cyanosis.

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* For original article see page 43.

On September 22, marked edema of the lower limbs set in and the tentative diagnosis of polyhydramnios having been made the membranes were punctured. Only an average amount of amniotic fluid escaped. A Champetier de Ribes bag was introduced and the vagina packed with gauze. A small child was expelled spontaneously. The abdomen was still distended with fluid and as the patient seemed distressed the abdomen was tapped with a trocar on September 27, and about two gallons of fluid withdrawn. It was clear, yellow, and showed specific gravity of 1,016. Circumference at umbilicus 35.5 inches. I first saw the patient on October 2 and found an unmistakable carcinoma of the left ovary which filled the lower left abdominal quadrant and made arrangements for its removal by laparotomy, which I did on October 6. The carcinomatous cyst was moderately adherent to the anterior abdominal wall, small intestine, and by one band to the liver. Its removal presented no serious technical difficulties. The diagnosis was confirmed by Dr. Eli Moschcowitz who pronounced the growth a papillary adenocarcinoma. The patient made a good recovery, the convalescence being temporarily interrupted by a rise of temperature and pelvic effusion about nine days later. Evacuation by an incision in the posterior culdesac cleared up this complication and the patient was discharged with her baby on October 28, 1910. Examination February 27, 1913, shows her to be pregnant three months but there is no sign of recurrence and she looks and feels perfectly well. In view of the danger of malignant degeneration of ovarian tumors, it ought to be the practice to remove all ovarian tumors at the earliest possible moment.

Dr. Sidney D. Jacobson reported a case of

SEPTATE UTERUS CAUSING FATAL PUERPERAL SEPTICEMIA.

The patient from whom this uterus was obtained by operation, was a women thirty-four years old and a primipara. Her family and personal history have no important bearing on the case.

During the first week in June, 1907, she went into labor at term and was delivered in her home by medium forceps operations. Within a few hours after the delivery her temperature rose to 104° Fahrenheit and she began to show all the typical signs of puerperal sepsis.

I was called to see her on the third day after delivery and found her with the symptoms of severe pelvic peritonitis and the appearance of a woman gravely ill. Upon bimanual examination the interior of the large and boggy uterus contained a distinct partition running from before backward and extending almost down to the cervix.

This partition divided the uterine cavity into two equally sized chambers, one of which was quite empty and the other filled almost entirely with a soft and friable mass of bad odor. This was evidently the cause of her sepsis and the pultaceous mass in one chamber of her bilocular uterus a false decidua which had not been expelled and had in some way become infected. I advised immediate hysterectomy, but the husband declined and finally agreed to a "cleaning" of the uterus. Accordingly the uterus was carefully curetted at her home and a considerable quantity of mushy and malodorous material removed. The uterus was irrigated with alcohol 50 per cent.

The patient improved somewhat, but still presented the picture of profound infection. On June 11, 1907, she was removed to a hospital and hysterectomy performed, as a last resort, hoping to thus give her a fighting chance for recovery. She died the next day with symptoms of pulmonary embolus.

This specimen is the uterus I removed by hysterectomy and is a large subinvoluted organ cut open longitudinally and shows the septum beautifully. I present this specimen to demonstrate the fact that a malformed uterus may become a fatal complication in labor.

UNILATERAL FUSED KIDNEY WITH X-RAY ILLUSTRATIONS.*

DR. ARTHUR STEIN read this paper.

EXTIRPATION OF THE KIDNEY FOR MULTIPLE FISTULÆ.

DR. ARTHUR STEIN reported this case and presented the specimen. The patient, a woman thirty-nine years of age, had been operated upon by Dr. Seeligmann for bilateral pyosalpinx on May 5, 1911. On opening the peritoneal cavity, it was seen that the pyosalpinx was firmly adherent to the omentum on both sides. There was an extensive general adhesion of the genitals to the intestine and a fresh peritonitis. During the attempt to remove the tube it burst and an abundant quantity of pus was evacuated into the peritoneal cavity. While attempting to remove the left pyosalpinx, the tissues were found to be so brittle that hemorrhage could not be arrested and total extirpation was carried out. Drainage of the abdominal wound was upward and toward the vagina.

About eight days after the operation it was found that urine was escaping through the abdominal incision and that a urinary fistula had formed to the abdominal wall. After the usual treatment this closed in the course of two or two and one-half months. About three weeks after the formation of this fistula, a vaginal fistula of the left ureter developed. The patient was discharged on July 4, with the abdominal wound closed but with the ureterovaginal fistula still patent. The patient was directed to return in a few months to have it closed.

She returned on August 31 in a rather emaciated and debilitated condition, stating that she had lost 80 pounds since the former operation. She complained of continuous pain in the left inferior part of the abdomen and had had chills during the week prior to her return. There was a pronounced feeling of pain along the left ureter, especially in its lower part. The vaginal contained urine, but otherwise the wound was found in a normal postoperative condition.

Cystoscopic examination showed that the bladder had a capacity of about 300 c.c. The walls of the bladder were normal. The aperture of the left ureter was somewhat distorted, and no urine was seen to escape from it after long observation. In introducing the catheter into the left ureter no difficulty was experienced but an obstacle was encountered about an inch above the aperture, making it impossible to insert the catheter any further. The function of the right ureter was normal, and also that of the right kidney. At the vaginal examination a narrow opening was found in the left fornix yielding clear urine very copiously. A narrow catheter was introduced through this opening and at a distance of about 3 centimeters from the opening an insurmountable obstacle was encountered. Urine was voided copiously through the catheter introduced into the fistula, justifying the conclusion that the fistula was located about 3 centimeters above the left fornix.

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*For original article see page 48.

Urinalysis showed that the urine from the right kidney was clear and yellowish and contained no cylindrical epithelial cells and very few white blood cells. Urine from the bladder was yellow with abundant epithelial cells and was somewhat flaky in consistency. The urine from the left kidney obtained through the vaginal fistula showed plenty of red blood cells, very few white blood cells, very few uric acid crystals and no casts. Judging from this examination the left kidney did not seem to be inflamed.

An operation was performed on September 15. The incision was made between the old scar and the anterior superior spine. After opening the abdomen it was seen that there were extensive old adhesions, especially between the bladder and the anterior abdominal wall. The ureter was distended to the thickness of the little finger and was very edematous. It was dissected free in its total length down to the fistula, where it was ligated and cut off, the proximal end being implanted into the bladder with two flaps in the usual way. The wall of the bladder was fixed to the external wall of the ureter with seven or eight sero-serous sutures. In order to secure abundant nutrition for the ureter, as much mesenterial fat as possible and adjacent intestine was sutured above it. The bladder was filled in order to demonstrate any possible leakage, but the place of the implantation was quite impermeable.

On the sixth day after the operation there was a gradual return of the urinary dribbling from the vagina and a few days later also from the abdominal wound. The bladder was perfectly intact consequently they had to deal with simultaneous fistulæ between the ureter and vagina and between the ureter and abdominal wall. The patient recovered but none of the fistulæ were closed.

As the patient objected to further delay before another operation was undertaken a radical operation for the removal of the fistulæ was decided upon. There were two methods of operation to be considered: 1. An attempt at implanting the ureter into the colon; 2. the total removal of the left kidney. The latter was chosen as being safer, after having established the fact that the right kidney was in absolutely normal working order. Implantation of the ureter into the colon did not seem to be a safe procedure in the present case as the danger of infection is still a momentous one in the implantation procedure.

On October 11, the left kidney was extirpated under chloroform anesthesia, the operation being completed in twenty-five minutes.

Since that time the patient passed through a normal period of convalescence, the right kidney voiding clear normal urine, the quantities varying between 1,000 and 2,000 c.c.

The anatomical report of the pathological laboratory showed a chronic interstitial nephritis and parenchymatous degeneration together with a chronic pyelitis.

The macroscopic examination showed a kidney about normal in size, the surface irregular and deeply furrowed. Here and there were remnants of adherent fatty capsule. The capsula fibrosa could be easily detached in places, while in others it was strongly adherent. At the latter places the surface was finely granular and irregularly hyperemic. Its consistency was irregular and rather firm. On cross-section the parenchyma appeared whitish and the cortex was somewhat blurred. The glomeruli could be seen rather distinctly. Numerous yellowish places were seen scattered over the cortex and marrow. The mucosa was thickened and covered with numerous petechial hemorrhages.

The microscopic examination showed irregularly distributed places of fibrosis which were similar to those found in ordinary chronic interstitial nephritis. The glomeruli were uniformly enlarged and strongly replete with blood, there being an abundant quantity of hyaline tissue between the glomeruli and the capsule. Similar tissue was found in abundant quantities in the lumen of the sinuous canaliculi. The epithelium of the latter was swelled and desquamated in many places. A cross-section through the renal pelvis showed pronounced subepithelial round-celled infiltration, together with moderate congestion of the capillary and small blood-vessels. Acute suppurative inflammation could not be demonstrated anywhere.

HERNIA OF THE UTERUS AND BOTH ADNEXA WITH REPORT OF A CASE.

Dr. Lillian K. P. Farrar read this paper. She related the history of the first case of hernia of the genital organs reported, according to Perilke, by Soranus of Ephysia, in 97 A. D. This case was interesting not only because it was the first case reported but because etiologically it was a description of what might be called the first stage of hernia of the genitalia. Although hernia of the ovary was observed at the close of the first century it was not until the nineteenth century that such cases were collected and studied. Hernia of one ovary was the first stage of hernia of the genital organs, hernia of one adnexa and the uterus was the second stage, and hernia of both adnexa and the uterus was the third or completed hernia of the genital organs. Less interest seemed to have been aroused by the second stage than by the third, if one is to regard accounts in the literature of this subject, for these were often meager, confused and contradictory. The literature of recent years reveals fifty-seven cases of hernia of the uterus of which fifty were inguinal, five femoral, one ischiatic, and one obturator. Of the fifty cases of inguinal hernia, eighteen were cases of hernia of the uterus and both adnexa which the author included in the third class, or completed hernias of the genitalia. As to the third stage, the author stated that there was but one writer so far as she could find who had collected known cases of hernia of the uterus and both adnexa. Bordeaux reported a series of five cases and one operated upon by Dr. Sorel in the Pasteur Hospital. In the list offered Dr. Farrar included the cases of hernia of the nonpregnant uterus and of the pregnant uterus which now seemed to include both adnexa. She recalled that two cases of inguinal hernia of the pregnant uterus had been reported, one in the sixteenth and one in the seventeenth century; in both instances the women died after the extraction of the child. In 1832 Fischer in the *London and Edinburgh Monthly Journal*, reported the case of a patient forty-four years of age who had had a right inguinal hernia for ten years previous to her marriage and from which she suffered severe pain in seven confinements. During her eighth pregnancy the uterus entered the sac, a Cesarean section was performed and the mother died thirty hours later, but the child lived. Ledesma reported a case in 1840 and Skrivan of Vienna one in 1849. In 1844, Winckel and Eisenhart of Munich operated on a right inguinal hernia of the tube, ovary and bicornate uterus; the right horn pregnant in the third month was contained in the hernial sac, and the left horn was in the abdomen. The Porro operation was performed and the woman made a good recovery. In 1895 Rosenoff reported the case of a patient who acquired a right inguinal hernia between her twelfth and thirteenth labors. During her fourteenth pregnancy it was discovered that the uterus was in the hernial sac, labor was induced and the uterus replaced the day after delivery. Eleven weeks later a radical operation for hernia was performed, the ovary, tube and intestine found in the hernial sac showed the origin of the hernia. In regard to hernia of the nonpregnant uterus, there was only one case in literature which corresponded to the one which the author presented. This case had been reported by Bylicki in Hrakow in 1878. This occurred in a woman thirty-nine years of age after her sixth confinement. She had previously acquired a right inguinal hernia. At operation the sac contained the right ligament adherent to the hernial ring, the uterus, two ovaries, two tubes, and a hydatid from the left ovary. All of the organs were replaced in the abdomen after removing the hydatid.

The case which Dr. Farrar presented was that of a woman thirty-two years of age, who had had five children, the eldest seven and one-half years and the youngest nine weeks. The first four labors were easy. When pregnant for the second time the patient noticed between the second and third month a mass the size of an egg in the left inguinal region, which was reducible when the patient was lying down and which was tender on pressure. She did not notice this mass later during pregnancy nor during labor. At about the second month of her third pregnancy she again noticed a mass which was larger but still reducible and which persisted during the entire pregnancy, but disappeared after labor. It did not appear at all during the fourth pregnancy, but during the fifth it appeared at about the third month and was much larger and more painful than before though still reducible. On rising on the seventh day after labor she again noticed the mass, which during the following four weeks was reducible, but for the next five weeks was irreducible and painful. On examination a left inguinal hernia was found which was irreducible and contained a solid body, broader below than above, firm in consistency, and somewhat tender on palpation. Two small growths were palpable below this organ and two others on a higher plane in the hernial sac. On bimanual examination, the cervix which was high in the vagina was found drawn to the left and continuous with the tumor in the hernial sac. This led to the diagnosis of hernia of the uterus and both adnexia in the inguinal canal. When Dr. Farrar opened the hernial sac it was found to contain the uterus, two ovaries, two Fallopian tubes, and two broad ligaments in the canal of Nuck. The uterus was turned to the right with the left adnexa anterior to the uterus and the right posterior. Both adnexa and uterus were normal. The hernial ring measured two inches in circumference and the tissues of the canal were very much softened. The round ligament was three or four times its normal size. The uterus and adnexa were easily returned to the abdomen and the wound closed by the Bassini method. The round ligament was cut to prevent recurrence of the hernia. The patient made an uneventful recovery and had had one child since with a labor of five and one-half hours' duration. On examination at the present time the uterus was well forward in good position and only slightly to the right of the axis of the pelvis.

After reviewing the theories that had been advanced as to the cause of hernia of the uterus, the writer stated that for the formation of a hernia three conditions were necessary: 1. An opening sufficiently large for the entrance of the viscus; 2. a movable viscus; 3. some force or attraction sufficient to bring the viscus through the opening. In women inguinal and femoral hernia of the intestine occurred with equal frequency. Hernias of the tube or ovary or uterus was, however, with few exceptions of the inguinal variety. The reason for this was usually to be found in the inguinal canal itself. The processus vaginalis peritonei, or canal of Nuck which was analogous to the funicular process in the male, should be closed just before or at birth. If it remained open a condition existed which was similar to that in the male and which was the cause of greater frequency of hernia in men than in women and one of the chief causes of hernia of the genitalia in women. In the acquired type of hernia of the uterus which was infrequent, if it occurred at all, the history was usually of a previous reducible hernia of the intestine. Multiple and too frequent pregnancies, or twin pregnancies, by overdistention of the abdominal wall, and consequent atrophy of the fat might increase the size of the hernial opening. The same effect might also be produced by the blood-vessels in the hernial canal, especially the veins and the round ligaments which increased in size during pregnancy. If there was a subinvolution of tissue in the ring or force directed against the opening before the tissues had had time to involute, as in early rising after confinement, the condition was then favorable for the formation of a hernia. The second condition, movable viscus, might be caused by pathological condition in the fetus, as, for instance, an exudative peritonitis in the fetus at any time when the ovaries and uterus were still in the abdomen and not occupying the position in which they belonged in extrauterine life, they might be prevented from making their descent, or if inflammation occurred before fusion of the Müllerian duct had taken place, this might be prevented with resulting malformation of the organ or its position. In cases occurring in adults, the adnexa and uterus usually entered the hernial ring either early in pregnancy when the uterus was enlarged at the brim of the pelvis, or shortly after confinement, when a condition existed similar to that in intrauterine life. The subinvolution which kept the uterus and adnexa at the brim of the pelvis gave to them an increased mobility owing to the same failure of involution in the broad, round and ovarian ligaments.

Force at, or traction on, as manifested by intraabdominal pressure was probably the most frequent cause of hernia of the uterus in cases occurring either in infancy or adult life. In cases occurring in adult life after confinement, the history was usually of laborious work, such as lifting, straining or washing, undertaken after a short lying-in period. Hernia of the uterus was always secondary to hernia of the adnexa, but a hydatid of Morgagni, or a fold of broad ligament, might precede the ovary into the hernial ring.

Diagnosis of hernia of the pregnant uterus depended on the signs of pregnancy occurring in the patient together with the changes occurring in the hernial tumor and the absence of all symptoms connected with a hernia of the intestine or omentum of corresponding size. Hernia of the nonpregnant uterus could be diagnosed only by bimanual examination. In a case complicated by the presence in the hernial sac of intestine, by suppuration or by strangulation of any of its contents, it would be difficult, probably impossible to make a positive correct diagnosis. The size, consistence and shape of the tumor if coupled with a history of its increased size at the menstrual period and of pain at this time referred to the hernial tumor, should lead one to suspect a hernia of the genitalia. If on bimanual examination the cervix was high in the vagina and the uterus could not be felt in the pelvis, but was connected with the external tumor, it would establish the diagnosis of hernia of the uterus. A sound introduced into the cervix which entered into the hernial tumor would make the diagnosis positive.

Where the pregnant uterus was in the sac, if the case was seen early, either an abortion should be induced and a herniotomy performed later, or a hysterotomy, which was really the operation of choice, should be performed and the uterus returned to the abdominal cavity, or if dealing with a malformed uterus its removal after the method of Porro. If the case was seen late in pregnancy a Cesarean section should be performed with reduction of the uterus if possible. If reduction was impossible, the Porro operation was advisable. In the nonpregnant uterus, operation was imperative as both uterus and adnexa were subjected to pressure and traumatism. The ovaries had frequently been found undergoing cystic, tubercular, sarcomatous or carcinomatous degeneration. The uterus was in danger of being strangulated and necrosed. Organs which were neither diseased nor malformed should be returned to the abdomen. If the broad ligament formed a part of the hernial sac and there was great difficulty in separating the ligament from the wall it might be necessary to amputate the adnexa in order to return the uterus to the abdomen.

DISCUSSION

Dr. William B. Coley stated that he greatly enjoyed the privilege of listening to what he believed to be the most interesting and scholarly paper on hernia of the uterus that had yet been written. He said that he had little to add except a brief report of two cases that had come under his personal observation.

Hernia of the uterus alone, without the tube or ovary is an extremely rare condition, as shown by the statistics of the Hospital for Ruptured and Crippled. In nearly 4,000 operations, of which about 700 were performed upon the female, the ovary has been found alone in four cases, the tube alone in one case, the tube and ovary in seven cases, and the uterus and tube in two cases. Dr. Coley, personally, had operated upon one case of hernia of the ovary alone, one of the tube alone, five cases in which the sac contained the tube and ovary, and two cases of hernia of the uterus. Curiously enough, these cases both occurred during the last year, and were operated upon at the Hospital for Ruptured and Crippled.

Case I.—M. B., age four and one-half years. Operated upon Oct. 4, 1912, for double oblique inguinal hernia, of three years' duration, a truss having been worn for two years. Operation was first performed on the right side; the sac was found to contain a broken tube and one horn of a bicornate uterus. In the left hernial sac was found a large and more completely developed horn of the uterus with a well-developed tube, and a large ovary which contained a few small cysts. The hernia on the left side resembled in type, a sliding hernia of the sigmoid or cecum, the uterus being attached to the posterior wall of the sac low down, making a high closure of the sac difficult. The peritoneum was separated from the surrounding tissue; the lower portion of the sac was cut off and the upper portion pushed down into the cavity. Patient made an uninterrupted recovery.

Case II.—S. J., ten years of age; hernia the size of a walnut, partly reducible; had worn a truss since infancy; operation, Jan. 31, 1913, disclosed a large sac which contained the left tube and ovary, and a large part of the uterus apparently normal in size. The left tube was adherent to the posterior wall of the sac. Bassini's operation was performed and the patient made an uninterrupted recovery.

Hilgenreiner up to 1905 was able to find reported but thirty-seven cases of hernia of the uterus, and his statistics show it to have occurred most frequently in middle-aged women who had borne children. In nearly one-half of the cases reported the trouble was associated with defects and malformations of the genital organs, *i.e.*, uterus bicornis, uterus bipartis, absence of one ovary, or pseudo- and true hermaphrodism. The diagnosis is seldom made before operation except in cases complicated with pregnancy. The great majority of the cases showed the presence of the tube or ovary in conjunction with the uterus. One of Dr. Coley's own cases showed the malformation of the uterus, which is pointed out by Hilgenreiner as uterus bicornis; in the other case, the uterus was apparently normal.

Dr. Coley did not believe it possible to make a diagnosis in children, although, in adults, from a careful clinical history, especially if complicated with pregnancy, it should be possible in a considerable number of cases. The condition, however, is so extremely rare that most observers are unlikely to see more than one case.

In regard to the distinction made by Dr. Farrar between the congenital and acquired types of inguinal hernia, Dr. Coley stated that he believed no definite lines of difference could be drawn. This differentiation between congenital and acquired types of hernia attempted in all the older text-books and many of the modern, he stated, was based on the erroneous belief that only those sacs in the male which communicate with the tunica vaginalis are congenital, and the others acquired. The very large number of operations for the radical cure of hernia performed within the last few decades, particularly in children, have shown that practically all sacs in inguinal hernia, except the direct, are due to the presence of a preformed sac. The fact, whether or not it connects with the tunica vaginalis, is quite immaterial and proves nothing either way.

In the female, the sacs of practically all oblique inguinal herniæ are of congenital origin, inasmuch as the direct type of hernia is extremely rare in the female.

As regards the etiology of hernia of the uterus, Dr. Coley believed the chief cause in children to be an abnormal mobility, or malformation of the uterus associated with a congenital sac and an abnormally large opening in the canal. He attributed little significance to the various theories of abnormally placed muscular fibers acting by way of traction, either as the cause of hernia of the uterus, or as an explanation of the various types of hernia associated with maldescended testis in the male.

Dr. Sidney D. Jacobson said: The uterus is formed by the coalescence of the lower end of the Müllerian ducts and the upper part of these ducts form the Fallopian tubes. In the human embryo of the length of about 8 millimeters at about the fourth or fifth week of intrauterine life, the little mass of germinal epithelium situated on the outer side of the Wolffian body begins to grow into the latter in the shape of a funnel. This funnel becomes the abdominal end of the tube. By proliferation of its elements a solid cord is formed called the Müllerian duct and this grows caudad on the lateral border of the Wolffian body and parallel with the latter until it reaches the distal end, the plica urogenitalis of Waldeyer.

The plica having rotated toward the center of the body in an arc of about 180° and rotating the Müllerian duct with it, causes the latter to move from the lateral edge of the Wolffian body across its front and finally to be placed medially The plicæ urogenitales, which approach each other as they descend, finally coalesce and become the genital cord, and the Müllerian ducts within their substance also approach each other and coalesce. They become the foundation above, for the Fallopian tubes, and below by absorption of the inner wall, the uterus and vagina. At the point where the Müllerian ducts coalesce delicate connective-tissue fibers extend toward the anterior abdominal wall forming the future round ligaments.

In view of these facts it is not difficult to understand the malformations of the uterus due to faulty coalescence of the Müllerian ducts. Their cause is not determined as yet. According to the older authorities it is due to a reduplication of the peritoneum known as the ligamentum rectovesicale. Thiersch believes it to be due to a too great width of the fetal body so that the lateral edges of the Wolffian bodies are too far apart. It has also been noticed that women suffering from double uterus have strikingly broad hips. I regret therefore that I cannot agree with Dr. Farrar that these malformations of the uterus are always due to bands caused by a fetal peritonitis.

TRANSACTIONS OF THE MEDICAL SOCIETY OF THE COUNTY OF NEW YORK.

Meeting of March 24, 1913.

The President, Brooks H. Wells, M. D., *in the Chair.*

The scientific session was devoted to a symposium on the general subject of cancer.

THE PROBLEM OF CANCER

Dr. Francis Carter Wood said that there remained unsolved three great problems in medicine, the cause of the exanthematous infectious diseases, the nature of some of the important diseases of metabolism, of which the most important were gout, chronic rheumatism, diabetes and exophthalmic goiter, and the nature of cancer. A partial resolution of the mystery surrounding diseases of metabolism seemed to be in sight, and some knowledge had been gained concerning the methods of transmission of those diseases due to a so-called filterable virus, but the cancer problem was still absolutely baffling despite the work of clinicians for generations, and there was but little hope of any immediate solution. The problem of cancer might be examined from a number of aspects: 1. From a purely clinical side, using human material entirely and disregarding as of little importance the results of the experimental method when applied to animals or to human beings, the object of the quest above all others being the discovery of a cure, without reference to the cause or origin of the various neoplasms; 2. As a phase of experimental pathology in which the human tumor was all important and the general question of interest only in so far as it explained or amplified the data obtained from the clinical and laboratory study of human tumors; 3. As a phase of general biology, in which instance the cancer of the mouse was as interesting as that of a man. From whatever direction the question was approached, however, the fundamental problem was simple. It was only why one cell grew without obeying the observed rules limiting tissue proliferation in adults, while other cells did not. Inversely, an equally important and difficult question was why the normal adult cells did not grow wild, but remained within very fixed anatomical regions. The final etiological question was, therefore, the problem of why a cell grew—a problem at the present time insoluble, and likely to remain so. It seemed to him that the last phase referred to, the treatment of cancer as a problem of general biology, first studying the cell and the influences which acted upon it and then endeavoring to elucidate the conditions by which cells could be so modified that they grew beyond their natural anatomical bounds and became cancers, was the only direction in which the problem could be solved, the human race being considered as merely one animal type and its cancers as a special variety of mammalian cancer. But centuries might elapse before they gained a profound insight into these obscure phases of life, and it would be unwise to center wholly upon this purely biological phase of the question because after all they cared little for the cancers of mice and rats except as they helped them to interpret the cancers of man. Hence, a mixture of the first and second methods of research was necessary, trying out on inoperable human cancers every hint which analogy might offer as suggesting a possible means of obtaining immunity against cells, using the knowledge now available as to the way in which bacteria attacked organisms. An enormous amount of experimentation had been done along the line of therapeutics, but unfortunately without consistent results. If therefore the discovery of fundamental principles lay in the direction of animal experimentation rather than along clinical observation, he thought it might be interesting to sum up what the experimental work of the last twenty years had accomplished, for it was only for this short period that inoculation of animals had been carried on to any extent and most of the work had actually been done in the last ten years.

The following facts might be regarded as proved: 1. That carcinoma in animals was not contagious. 2. That carcinoma in animals was not due to a parasite. 3. That the morphology of carcinoma throughout a long series of propagations remained much the same. 4. That in the transplantation of carcinoma from one animal to another the new tumor was produced entirely from the cells transplanted and no transplantation would occur if the cells were crushed or their individuality was in any way destroyed. 5. That occasionally in the course of a transplantation of a carcinoma, a sarcomatous change might be induced in the connective-tissue elements of either the stroma of the tumor or, what was more likely, the connective tissue of the animal in which the new tumor developed, so that a sarcoma was produced which might overgrow the carcinomatous portion, and the resulting tumor continue as a pure sarcoma. This phenomenon coincided with the observation occasionally made in human beings, of a mixed carcinoma and sarcoma, but of course no proof of the permanence of the sarcomatous element had been obtained because of the impossibility of inoculation experiments in human beings. It was suggestive, however, that in metastases from some of the tetratomata both the sarcomatous and carcinomatous elements or either formed alone might metastasize. 6. That the microscopical structure of a tumor was no certain guide to its malignancy. With certain reservations this applied quite as well to human beings as all pathologists would agree. Mechanical conditions, such as the relation of lymphatics and blood-vessels, seemed to play just as important a part in the malignancy of a tumor as its purely morphological cell structure. 7. That there was a very marked difference in susceptibility to tumor inoculation in animals of the same species under different conditions of stock, climate and nutrition. This showed how delicate was the balance between tumor and the host, and gave a reasonable basis for hope that by modification of conditions of living they might diminish somewhat the incidence of carcinoma. The rarity of malignant tumors in certain human races pointed also along this line. So much for the purely morphological results of the study of animal tumors.

From the study of immunity and therapeutics the following conclusions had been obtained:

8. That it was impossible to transfer tumors from one species of animal to another. Recently a statement to the contrary was published in Germany, but as no microscopical findings were included in the report the result was of no value. 9. That apparently no general immune reaction to carcinoma was produced in the fluids of the body; that was, when live cancer cells were introduced into an animal they did not act as did bacteria or foreign proteins, by the production of antibodies, but that healing, if it occurred, was due to local tissue resistance. As an example of this, mouse sarcoma would not grow when transferred to a rat, but the cells of a mouse sarcoma would grow easily in the blood serum of a rat. This tissue reaction confirmed the observation which could occasionally be made on human beings, where a very marked regression took place owing to the choking up of the growth by extensive proliferation of fibrous tissue. 10. Finally it had been shown that autolytic products or the expressed juices or crushed or ground cells of tumors had no capacity to induce immunity to carcinoma in an animal, but on the contrary such material might often produce an increased sensitiveness to tumor growth. Only growing, uninjured cells had the capacity to induce immunity and this immunizing power was in-

herent, not only in the tumor cells but also in normal tissue cells, such as blood-corpuscles or the cells of the skin, liver, kidney, or spleen from animals of the same species.

While immunity to the inoculation of carcinoma could be obtained by some of the means mentioned above, no cure could be effected after the graft had taken. Radium and the *x*-ray were the only agents which would regularly produce regression of an inoculated tumor, but unfortunately they had but little influence on a carcinoma developing spontaneously in an animal. The use of animals offered them a convenient experimental material of reduced virulence by which they might try out various therapeutic measures under the best conditions; the animal not having developed its own tumor but one having one transplanted to it from another animal offered the optimum opportunity for positive therapeutic results. It seemed to Dr. Wood that the lines of attack for the future were for the biologist to learn as much as possible of the methods of influencing the growth of the normal cell. What the biologist must show them was why normal cells were incapable and tumor cells capable of indefinite propagation. The question of the nature of the immunity following the inoculation of living cells must be reexamined with the greatest care. The serologist must be called in to settle the still disputed question of serum reactions following the inoculation of living cells and the question of the presence or absence of immune substances in the blood. He called attention to the repeated suggestions that the great group of human diseases including myeloma, sarcoma, lymphosarcoma, chloroma, and leukemia, was probably due to some infectious agent. The close relationship of these conditions to Hodgkin's disease, now apparently definitely classed as an infectious condition, was extremely suggestive.

THE SURGICAL PATHOLOGY OF CANCER.

Dr. Thomas S. Cullen of Baltimore, Md., presented this part of the symposium and emphasized the importance of cooperation between the laboratory man and the surgeon and believed that in the future all surgeons would be trained laboratory men. If the abdomen was opened, and if the surgeon was familiar with his pathology, it would give him a clew as to the work he would be called upon to do in that part of the abdomen. Again it would give him a clue which would enable him to determine whether or not an operation was feasible for the complete relief of the patient. While many investigators were trying to determine the cause of cancer, there were many who were trying to get at an early diagnosis because no matter what the cause might be, the cure of the patient depended to a large extent upon the early diagnosis. Dr. Cullen then briefly reviewed some of the chief varieties of cancer. All evidently were familiar with cancer of the skin and lip. These must be differentiated from papillary growths. With regard to cancer of the tongue, it had been pointed out that the milky patches upon the tongues of smokers if removed at once would result in no further trouble. But if one waited for some time without any interference carcinoma would develop. In cases of carcinoma of the lip, if the radical operation was performed the chances of complete cure were good. In carcinoma of the stomach surgical pathology did not aid them a great deal. If one waited for the stomach washings of the characteristic lesions to make a diagnosis of carcinoma of the stomach it would be so late in the disease that little if anything could be done for the patient. The only thing to do was to make an exploratory operation and to learn whether one was dealing with cancer of the stomach, a cancer of the duodenum, an ulcer of the stomach, or an ulcer of the duodenum. The surgeon as well as the pathologist was aided by a fluoroscopic examination, and this was destined to play a large rôle in making early diagnoses. If one had to deal with carcinoma of the intestine, signs of obstruction appeared fairly early and more and more cases were now apparently cured by early operation. The pathology here was quite characteristic. Cancer of the rectum and lower sigmoid they were able to detect by means of the proctoscope, and by its use many early diagnoses were made. In fact, with the proctoscope in the majority of the cases a diagnosis was relatively easy.

Dr Cullen was most interested in what Dr. Wood had to say in his discussion of carcinoma and sarcoma. Two or three years ago he diagnosed what he thought was a malignant growth of the ovary; it was one that, however, he could not quite understand. The histological examination of the stroma showed carcinomatous tissue while other parts of this organ showed sarcoma. In other words there seemed to be two growths present in the ovary independent of each other. This patient was watched very carefully knowing that a permanent recovery was out of the question. The patient died in one year and the local return was sarcoma.

There were two chief growths of cancer that were very important and which the surgeon had so often to deal with, cancer of the breast and cancer of the uterus. As they knew, cancer of the breast in the early stage might be beneath the skin and there might not be any adhesions or puckering; but as the disease advanced there occurred this characteristic puckering of the skin. If one cut into the growth and cut out a local area, the removed portion could be immediately recognized; if it was pronounced cancerous, then the complete and radical operation should be done together with the removal of the axillary glands.

Dr. Cullen then took up the surgical pathology of the uterus and threw upon the screen histological pictures of what was normal and also of what was pathological. In cases of cancer of the uterus, the pathologist acted as the Supreme Court and decided whether or not cancer existed, and it depended upon him whether the patient was to be subjected to a dangerous operation or not. As Dr. Cullen had pointed out, there was the closest cooperation between the laboratory man and the surgeon—between the pathology and the clinical side, and it was very fortunate if the two were combined in the one man. In the cases where a diagnosis of cancer was made, this diagnosis was backed up by a careful examination of the specimen after removal. Some of the pictures thrown upon the screen were the following: Normal vaginal portion of the cervix; a transverse section of the same; normal cervical mucosa; normal cervical glands; a determination of the way cancer developed—the manner squamous cells developed; cross-section of finger-like growths with squamous cells; squamous cell carcinoma of the cervix; partial obliteration of cervical glands; partial obliteration of cervix quite apart from squamous cell carcinoma of the cervix; cell nests of squamous cell carcinoma; passive involvement of uterine glands in squamous cell carcinoma of the cervix. In considering the differential diagnosis Dr. Cullen threw pictures on the screen of dilatation of the glands of the cervix; sections of hypertrophy of the cervix; cervical polyp; eversion of cervical mucosa, the so-called "erosion"; margin of ulcer of the vaginal portion of the cervix; cross-section of a silk ligature; condylomata of a tuberculous cervix of the vaginal vault. In considering the body of the uterus he threw upon the screen pictures of normal endometrium; normal endometrium in the period of menstruation; endometrium after the menopause; normal uterine glands deep down in the muscle; projections of gland cavities from the sides and base; suspicious changes in the uterine mucosa; picture resembling squamous cell carcinoma due to distortion of the epithelium by the curette; early adenocarcinoma of the body; adenocarcinoma limited to the superficial portion of the mucosa; delicate branching outgrowths; manner in which new glands were frequently formed in adenocarcinoma; presence of malignant growths in the uterus; carcinomatous glands in adenocarcinoma of the cervix; atypical proliferation of the gland epithelium; commencing carcinoma of the body. In the consideration of differential diagnosis he showed pictures of hypertrophy of the uterine gland in both the pregnant and nonpregnant uterus; normal placenta; development of decidual cells from the endothelium and blood-vessels; decidual giant cells in underlying uterine muscle.

THE GENERAL PRINCIPLES OF THE SURGICAL TREATMENT OF CANCER.

Dr. John A. Hartwell read this paper. The experimental studies on cancer which were being so extensively conducted in nearly every medical center of the world, gave rise to the hope that at some time there might be a means other than surgical excision for treating the disease. This hope, however, must not obscure the fact that at the present time the only treatment which was effective was an operative procedure. The degree of effectiveness which this treatment yielded was based on well-defined principles, and it was with these that they were immediately concerned. The fact of prime importance was, that in its incipiency cancer was a local lesion. Whatever might prove to be the predisposing or exciting causes which lead to the uncontrolled and lawless growth of cells, which was typical of cancer, these causes always primarily acted on a localized area, and were neither general nor widely distributed as was the pathogenic factor in so many diseases. In the early stages, too, the growth was entirely by continuity. Hence, there must be a time in its life history when every cancer was amenable to complete eradication, unless it was placed in such a region that its inaccessibility rendered this technically impossible. Since, however, the growth was uncontrolled and lawless, it followed that sooner or later the disease ceased to be a localized lesion, and at that stage its complete eradication was not a possibility. This statement ignored the rare instances in which the cancer cells seemed to find a host sufficiently resistant to destroy them. Fortunately cancer attacked with the greatest frequency the stomach, the uterus, the rectum, the large and small intestine, the female breast and the structures in and around the mouth, and in about the order named so far as frequency was concerned. It was comparatively rare as a primary lesion in the pancreas, the liver, the brain, and the lung. From this it might be seen that cancer occurred in the majority of cases in an accessible region and patients suffering from it in every one of these regions had been successfully and permanently cured by the surgeon. Beyond question surgery afforded a cure for cancer in a very large number of cases, and yet the death rate was enormous and appeared to be on the increase. Four reasons were responsible for this deplorable state of affairs: 1. The carelessness and ignorance of the medical profession. 2. The carelessness and ignorance of the laity. 3. The inherent difficulties in diagnosing many cancers in the early stage, even by the greatest care of the best trained observer. 4. The fact that surgery had yet much to learn concerning the overcoming of the difficulties which surrounded the complete eradication of the disease. That the first two factors were important was proven by the figures of the Pennsylvania Cancer Commission in an investigation of 400 cases reported from individual physicians and surgeons throughout the state showing that superficial cancer had been apparent on an average of eighteen months before the case came to the surgeon. Eleven months had elapsed between the time a physician had been consulted and the date of the operation. In deep cancers this time was one year. About one case in thirty of breast cancers was not even examined by the first physician consulted and in one case in six, salves, ointments, etc., were prescribed with advice to temporize. Only 68 per cent. of superficial cancer were operable when they came to the surgeon. The figures were even more emphatic in their condemnation in cancer of the stomach and uterus. Only 48 per cent. of deep seated cancers were operable when first seen by the surgeon. Figures showed that their own community was equally open to criticism. The records of one of the large hospitals in New York City showed that from 1905 to 1910 sixty cases of pyloric carcinoma were admitted to the surgical division, ten of whom had previously been in some hospital for the same condition. Seventeen had been suffering from well-pronounced gastric symptoms for one year or more, and six others for six months. Of the sixty cases forty-five were operated upon with the following results: Over 63 per cent. were found totally inoperable, so far as removing the growth was concerned; only seven were deemed suitable cases on which to attempt the removal of the disease by a partial gastrectomy, and in four of these the lesion had so far advanced that death resulted. Eight were considered inoperable from the clinical examination, four refused operation and two improved sufficiently under hospital treatment to be discharged without establishing a positive diagnosis by an exploratory operation. In other words only three cases out of fifty-four in whom the diagnosis was in doubt were really proper cases for the application of the only curative treatment for cancer which was at present known. There were admitted to the medical wards, fifty-three cases diagnosed as carcinoma of the pylorus, and of these only one was found at operation to be sufficiently limited to warrant a radical removal. The remaining forty-five were not operated upon. Nineteen of these died in the hospital, thirteen were discharged unimproved, and eleven were discharged improved; two were discharged as cured, the symptoms not being in evidence and the diagnosis being in doubt. There were, therefore, 102 cases of pyloric cancer admitted to the hospital during a period of five years and only three were successfully treated by the radical removal of the disease, and what was worse, only ten were in condition to attempt such treatment. As an illustration from personal experience Dr. Hartwell cited the case of a patient who was referred to him by a prominent gastrologist. This patient showed symptoms of serious gastric disturbance with loss of weight, which were assigned to neurosis caused by overwork. He was advised to take a long rest traveling abroad. Less than a week later, and just prior to his sailing, he developed acute abdominal symptoms for which an immediate operation was necessary. An inoperable carcinoma of the pylorus was found. There was no justification for thus temporizing with a disease that inevitably proved fatal if left alone. Every patient who presented symptoms which made the diagnosis of a deep-seated cancer seriously to be considered, was entitled to and should have urged upon him, the exploratory operation. Dr. Hartwell cited statistics showing the good result obtained by resorting to gastrectomy and concluded that it was little less than criminal that in a city like New York only one case out of thirty, admitted to a general hospital, reached the surgeon's care early enough to allow of his being permanently helped. The causes at work in the production of such results were difficulties in diagnosis and carelessness; a spirit of *laisser faire*, which meant laziness and possibly ignorance were more potent however. When a patient told a physician that she has a lump in her breast and he did not examine it he was guilty of criminal carelessness. If a man presented himself with a chronic ulcer on the lip, which had proved itself obstinate to home remedies, and the doctor cauterized it, or prescribed irritating salves, he was equally culpable. One had no right to be cautious in self-criticism for such things; they should acknowledge their weak spot and thus take the first step toward remedying it. The campaign inaugurated by the Surgical Congress at its recent meeting for education on the subject of cancer was a step already taken. This campaign must be energetic and continuous and must be primarily directed toward an improved condition of affairs in their own ranks. The principle of all importance was that cancer was at first a localized disease and was then curable while later it was neither. Therefore he made an emphatic appeal for the exercise of every diagnostic aid, including exploratory operation if need be, for its early recognition. A second principle rested on the fact that certain lesions might be transformed from a benign to a malignant character. The Pennsylvania Commission found that 39 per cent. of superficial cancers and 40 per cent. of the deep seated, could be so considered. Notable examples of these were seen in the leukoplakia of the tongue, the chronic ulcer on the lip, the pigmented mole, the chronic pyloric ulcer, the colonic diverticulum, and possibly the most important of all, chronic cystic mastitis or abnormal involution of the breast. Experience had proven to the satisfaction of every surgeon and pathologist, that every one of these conditions had changed from a benign to a malignant growth. If the physician would learn this pathological lesson and explain to the patient that surgery in a much more dreadful form was the outcome of a waiting policy, the author ventured to affirm that a much larger number than at present would elect to have the early operation. Dr. Hartwell made a plea for the more constant use of the word precancerous, which signified that changes had taken place in the tissues as the earliest manifestation of a beginning epithelioma or carcinoma. It was precancerous because cancer in its general clinical meaning was not yet present, but would inevitably follow if nothing was done to stop it. Ribbert described this stage exhaustively in his book on human cancer as being demonstrable in all cases of cancer of the skin under the term "Beginnende Haut Karzinome" and illustrated the changes which he conceived as belonging to it, namely, round-celled infiltration of the subcutis prior to the lawless breaking out of the epithelial proliferation. Similarly in stomach cancer he described a very early change which could not properly be diagnosed as carcinoma but which was certainly destined to become such. Ziegler, Adami, Bland Sutton, and B. J. Lee have referred especially to the precancerous stage. The term was already widely used in literature and it would be unwise to discard it for any other, but what was needed was a fuller grasp of the import of the word by the clinician.

The operative principles which must guide the surgeon in the management of cancer were based, first, on the fact that growth from the original focus of the tumor followed, in individual localities, definite lines, and second, on the fact that cancer cells had an inherent vitality which made them capable of growth when planted in a favorable environment. Active cancer cells might have readily extended far along lymphatics or fascial planes without producing any alteration visible to the naked eye. Experience had taught in general what directions would be taken but there was a great dearth of knowledge as to which type of tumor was the most active in rapid and wide dissemination. They knew that the squamous-celled epithelioma of the face was usually localized within narrow limits, and that the tubular carcinoma of the buccal cavity rapidly proliferated cells which might reach so far that even an early radical operation failed to remove them all. Between these two extremes were all grades, an exact knowledge of which was lacking. The result was that often needlessly mutilating operations were done, or more to be regretted, an insufficient removal was followed by a rapid recurrence. Only a very careful correlation of the clinical history, the operative procedure, the exact morphology of the tumor, and the ultimate outcome of the individual case would ever solve this problem. Bloodgood in Baltimore had made a start in breast cancer. Every surgeon should see to it that his clinic was organized along similar lines. By so doing a period of five years would be sufficient to collect data that would go far toward establishing the relative malignancy of carcinomata on a foundation that would add greatly to rational methods of an exact operative interference.

The fact that cancer cells possessed the power of independent growth, when favorably transplanted, had a very important bearing on operative technic. Having decided in the individual case what must be the extent of the operation, it was imperative that the removal begin at the most distant points, and proceed in an orderly manner toward the most advanced points, always avoiding any exposure of parts already involved. Rough handling must be guarded against to prevent the mechanical extension of cells to new fields. Care should be exercised in making examinations, removing fragments for microscopical study, etc. The principles governing the surgical treatment of cancer might be summed up by emphasizing the facts that cancer could be cured if operated upon early, but at present there was a frightful discrepancy, owing to needless and often culpable delay, between what could be done, and what was done; and second, in many instances a precancerous condition existed, and the term, with a definite knowledge of its significance, should become one in general daily use by the clinician; third, the knowledge of the relative malignancy of different cancers was meager, and this could be remedied by properly organized studies; and fourth, cancer cells were active entities with great potential evil, and hence should be treated in such a way as to limit their extent when once they had found a place in the human body.

THE PROBLEM IN LOCAL RECURRENT BREAST CANCER.

Dr. C. W. Strobell, of Rutland, Vt., read this paper. He stated that his contribution to the symposium should be regarded as supplemental to the one published in the *American Journal of Surgery*, November, 1912, entitled, "A New Method of Treatment of Cancer of the Breast based on Nature and Causes of Recurrence." That the question of recurrence in cancer of the breast was a very real and live problem needed no defense. Recurrence was of far greater concern to the surgeon than primary extirpation, because in the primary operation the case was, as a rule, in the so-called operable class, and held out a reasonable hope of an ultimate cure; whereas, confronted with recurrence, the surgeon was quite helpless in view of the fact that further excisions were usually but palliative measures. Present-day results as regarded both cure and recurrence compared favorably with those set forth by Gross in his "System of Surgery" in 1882, but whatever had been accomplished in this direction could not be credited to either the accuracy or the utility of Connheim's theory of the embryonic origin of tumors as applied to malignant disease. This theory must go so far as the origin of malignant tumors was concerned. Malignant tumors recurred and metasticized and these attributes were characteristic of pathogenic infection. The rapidity of a recurrence depended upon many conditions, none of which were definite or absolute, so that even in the most carefully selected cases operated upon under ideal conditions, there might be primary recurrence within two or three months, while again recurrence might be surprisingly delayed as notably in scirrhus conditions. Recurrence following radical extirpation was almost universally regarded as an external evidence of internal metastasis. Dr. Strobell thought it should not be so regarded. It simply meant the perceptible evidence of renewed activity of surviving specific pathological organisms. If internal metastasis to an abdominal or pelvic viscus existed at the time of the recurrence, it so existed independently of the latter. Metastasis dating from a local recurrence was only by continuity through the chest wall to the pleura and lung, and thence to the general system. Whenever metastasis to any part of the abdominal or pelvic viscera manifested itself prior to or coincident with recurrence, it was certain that the primary operation was too late. This could not be known at the time of the operation for the reason that the beginnings of all disease processes were microscopic rather than macroscopic, and that thus early they were without appreciable symptoms. To-day for the first time in medical history there was apparently something tangible on which to hang their hopes which consisted mainly of the obvious fact of infection by a specific pathogenic cancer germ, and the apparently corroborative results of the new chemic surgery. This new chemic surgery was based upon the above assumed facts, and upon scientific principles and questioned altogether the expediency or safety of extirpation by excision through presumably healthy adjacent tissue. The foregoing facts should be accentuated in connection with the importance of the speedy and most radical secondary operation upon the earliest indication of recurrence, such as could only be accomplished with any degree of scientific certainty by the new chemic technic, outlined in the article previously referred to. By the employment of his technic, recurrence, unaccompanied by internal metastasis, was a curable condition.

Dr. Strobell reported an illustrative case and exhibited photographs of the patient who had a recurrence, as was usual, along the line of incision and suture with secondarily infected trauma nodules studding the field above and below, which in similar cases were probably due to tension or other sutures, or drainage punctures and stabs. The center of the line exhibited an ulcerating aggregation of nodules. At the axillary line was a larger mass as yet intact.

Superior to this was a large freely movable lymph node, the size of a robin's egg. The tissue to be removed was firm, unyielding, and fixed to the chest wall. The involved area measured 7 by 9 inches in transverse diameters. It was a case in which few surgeons would have a disposition to employ reexcision. The patient was seventy-two years of age and a radical standard extirpation had been done in 1910. At the expiration of a year and three months evidence of recurrence was noted, and two months later the case was referred to the writer for chemic surgery. The problem was most difficult as the devitalization had to be most carefully gauged and guarded, on account of the near proximity of the pleura to the overlying affected areas and the close relationship between the axillary vessels and the large node under the pectoral stump. The tissues within the circumscribed area down to, but not involving, the periosteum of the ribs, together with the enlarged node were removed, a fine granulating surface eventually presenting. This surface was then covered with skin grafts, every one taking. Under the influence of the important modifications in the previously described technic the discomforts attendant upon previous operation were almost wholly abolished. These grafts had now the same appearance as the surrounding skin. The skin was quite freely movable. The operation was done in November, 1912, and at the present time the patient was in fine condition.

Subsequent to taking the photograph which was presented a few very small lentil-like papules discovered well outside the operated areas were devitalized as a precautionary measure.

HOW WE MAY REDUCE THE MORTALITY FROM CANCER OF THE UTERUS.

DR. HERMAN J. BOLDT said that most members of the medical profession being agreed that when cancer was diagnosed in an early stage it could frequently be cured permanently, the responsibility rested on them to make diagnoses sufficiently early, if the patients presented themselves for examination. They all knew that the onset of cancer was so insidious that many patients with cancer of the uterus had no marked symptoms at all until the disease had passed beyond the limit of operability. On the other hand, there were patients who were treated with local applications for "ulcerations" of the uterus until too late for a radical operation without a hint from the physician that it might be a serious condition. Then, too, there were cases that were not even examined, the patients being told that the profuse or prolonged or intermenstrual loss of blood was caused by "change of life." It was well known that a cancerous degeneration sometimes occurred on the surface of an erosion, but in a very early stage they could make a positive diagnosis only by the aid of a microscope. Dr. Boldt emphasized the importance of a competent pathologist, as only an expert could correctly interpret the findings. There were no early symptoms peculiar to the incipient stage of cancer of the uterus, the earliest symptoms being leukorrhea and atypical bleeding. Leukorrhea was as a rule an earlier symptom than bleeding. Every woman who was spotting, who had atypical losses of blood and profuse leukorrhea, particularly when past the fortieth year (and still more important was the slightest loss of blood after the menopause)should be carefully examined, because these symptoms were also early symptoms of cancer. When a physician was in doubt he should get the opinion of a recognized specialist. Cervical tears, accompanied by erosins, should be treated locally, and the laceration repaired, because occasionally such a condition became the seat of cancer. When a patient with cancer of the uterus was examined, the rectovaginal examination should always be made because only by it could the parametria be palpated. The cystoscopic examination should always be made although one could not rely upon its infallibility, since at times the bladder was markedly involved when the cystoscope failed to show such extent of the disease. To a certain extent every abdominal operation for cancer of the cervix should be considered an exploratory operation.

As to what were the most effectual means of reducing the high mortality from cancer of the uterus the general answer briefly stated had been that knowledge of the early symptoms of cancer of the uterus should be disseminated through the medium of the newspapers and magazines. So strongly had this been emphasized that at the recent meeting of Clinical Surgeons of North America, a committee was appointed to devise means of securing such publicity. If publications were to appear in the lay press, the method recommended by the committee was the only one that was strictly ethical. The printing of articles with the name of the author attached was reprehensible. All articles should bear the stamp of the approval of the American Medical Association. While it was evident from the report of the Board of Public Instruction on Medical Subjects that difficulties were encountered in connection with the general publicity question, nevertheless it seemed that conditions had changed and that the obstacles there mentioned could readily be overcome, simply by placing matters in the hands of men possessing influence with the lay press. Thus the publications, if decided upon, could be made in harmony with the high standard required by the majority of the medical profession. During the past summer the author was in Germany and had asked a number of men who were connected with university hospitals and who had studied carefully the question of publicity whether they had found the publicity method was of any advantage. Their answer was that they had seen no larger proportion of operable cases, since the "Winter" circular letters had been sent out and since the lay press had published letters written by Winter on the subject of uterine cancer. What they had observed was that a goodly number of neurasthenic women were made more nervous and consulted physicians in fear of cancer. Dr. Boldt said that, in his opinion, they were not likely to get under observation a larger number of incipient case of cancer of the uterus by giving the cancer symptoms to the lay press. On the contrary, it was more than likely that of the large number of women suffering from leukorrhea, those of the neurasthenic type would simply acquire an aggravation of their nervousness with the result that they would rush to physicians for examination, and if told that they had no malignant disease would be distrustful and seek the advice of others. The only rational way to reduce the mortality was to impress on the profession the grave importance of being conscientious in the matter of examination and never superficial. Let the teaching on this particular subject come from the family doctor and not through the newspapers and magazines. Since women had become educated to the dangers of cancer of the breast they did not hesitate to submit to an operation for such an affliction. How had the public been instructed in this case? Not by the lay press but by the physician. As a result of this teaching the word had gone from woman to woman: "If you have a lump in your breast, lose no time in consulting a doctor." To bring about a lower mortality from cancer of the uterus it was only necessary that the members of the medical profession should use in practice what they so well knew in theory concerning the occurrence of the first symptoms of cancer of the uterus. More practical benefit would be gained by impressing on physicians the grave risk of treating with internal or local medication, before being sure that no malignant condition was present, a patient who had even the slightest suspicious symptom. Not until the medical profession became resolved that in cases that presented even the slightest subjective or objective symptom of cancer it was the moral duty of the physician to use every available method to negate a cancer diagnosis, before he allowed the woman to pass from under his observation, should they be able to reduce the mortality from uterine cancer. If this could be brought about the percentage of radical cures by operation would increase 50 per cent. Of every cureting the scrapings should be examined. From every cervix that appeared suspicious of cancer enough should be excised for microscopic examination. When the diagnosis of cancer had not been positively excluded such patient should be constantly under the observation of her physician. As to treatment when a diagnosis of cancer of the uterus had been made, the extended abdominal operation was the operation of choice for the greater number of patients. The exceptions to this general rule were those who were very obese, cases of cancer of the body of the uterus when the uterus was freely movable, and cases of incipient epithelioma of the vaginal part of the cervix. Patients who had passed the incipient stage should be operated upon by the abdominal route, and the operation should be done extensively, the parametria and enlarged glands being removed. The ordinary panhysterectomy, the original Freund method, was inadequate. The old technic of vaginal hysterectomy was on a par with the operation known as Freund's operation so far as remote results were concerned, and it was superior in primary results. In women who were very obese the vaginal operation devised by Schauta, in connection with the paravaginal section described by Schuchardt, should be the method of choice. By the latter method the parametria might be removed quite extensively although the glands could not be extirpated. Borderline cases were those in which the disease had so far advanced that while one found it possible to extirpate the cancerous uterus, it was very doubtful, indeed improbable, that all malignant structure could be removed. The author did not favor the extended abdominal operation under these circumstances since the primary mortality necessarily was very great, and the remote results were comparatively still more unfavorable. In cases of his character a palliative operation with an actual cautery was better for the patient, just as in instances at once diagnosed as inoperable by radical means. In discussing the treatment of cancer *x*-ray therapy was clearly entitled to a place since numerous patients with cancer in other locations had been benefited by such treatment. Thus far Dr. Boldt said he had had a number of women subjected to this treatment, but had not seen one instance markedly benefited by the *x*-ray in uterine cancer. Dr. Bumm, however, reported a very interesting case. This case showed that from a clinical point of view by vaginal *x*-raying large doses might be administered without causing burns of the mucous membrane and that under the influence of intense raying a hardening of the tissues of the vaginal vault, the cervix, and the pelvic connective tissue occurred which not only hindered further dissemination of the cancer, but also, after expulsion of the cancerous masses, effected a purification of the cancerous crater and a cessation of ichor and hemorrhage. As a result of the tissue sclerosis the diffuse infiltration of the parametrium became sharply circumscribed from the surrounding structure, and the formerly inoperable cancer became operable. The microscopic examination in this case was somewhat disappointing. The lining of the cervical wound cavity showed everywhere a thin, not visibly changed, layer of strongly celled infiltrated tissue, and then by a voluminous layer of sclerosed connective tissue, which almost entirely superseded the muscle lamellæ. In the parametrium and even outside the callous cancer nests were found; the sclerotic glands were free. Frequently reports had been made of cases in which inoperable cases had been rendered operable by the use of the *x*-ray, but might it not be that if the treatment had been continued a cure might have been effected if the *x*-ray treatment had been continued. More work and observation of this character were needed. It had not been his good fortune to see any patient so improve under *x*-ray treatment as to become operable.

Dr. Franz Torek reported on a case of

RESECTION OF THE MIDDLE PORTION OF THE ESOPHAGUS FOR CARCINOMA,

the first case that had ever been successfully operated. He performed the operation on March 14, 1913, on a patient sixty-seven years old. The tumor was just below the arch of the aorta. His incision was carried through the whole length of the seventh intercostal space from the posterior end of which the incision was continued upward, cutting through the seventh, sixth, fifth, and fourth ribs at their angles, which was simpler and gave a better exposure than any of the other methods of access. To reach the part behind the arch of the aorta a number of its thoracic branches were divided and the aorta was lifted forward. To do away with the danger of leakage from the upper stump of the esophagus, which had been the cause of many deaths, he dissected the whole esophagus free and brought it out through an incision at the anterior border of the left sternocleidomastoid muscle. The patient made a satisfactory recovery. Dr. Torek called attention to the fact that success depends largely upon early diagnosis.

ITEM.

CLINICS, DEPARTMENT OF PUBLIC CHARITIES, NEW YORK CITY

Calendar for July, 1913.

Kings County Hospital (Brooklyn).—Gynecology, Dr. McNaughton, Mondays, 9:00 A. M.

Cumberland Street Hospital (Brooklyn).—Gynecology, Dr. Burnham, Tuesdays, 1:00 P. M.

City Hospital.—Obstetrics, Dr. Shears, Wednesdays, 2:00 P. M.

Coney Island Hospital.—Pediatrics, Drs. Beck and McQuillan, Wednesdays, 3:30 P. M., Pediatrics, Drs. Pendleton and Van Wart, Wednesdays, 3:30 P. M.

City Hospital.—Gynecology, Dr. Stearns, Thursdays, 2:00 P. M.

Cumberland Street Hospital (Brooklyn).—Gynecology, Dr. Burnham, Thursdays, 1:00 P. M.

Coney Island Hospital.—Gynecology, Drs. McEvitt and Mills, Thursdays, 10:30 A. M., Gynecology, Drs. Mayne and Ranken, Thursdays, 10:30 A. M.

Kings County Hospital (Brooklyn).—Gynecology, Dr. McNaughton, Fridays, 9:00 A. M.

All registered physicians, visiting and resident, and medical students, are cordially invited to attend these Clinics. Cards of admission, valid until October 1, 1913, may be obtained at the Academy of Medicine, 17 West 43d Street, Manhattan, and at the Medical Society of the County of Kings, 1313 Bedford Avenue, Brooklyn, as well as from the Secretaries of the several Medical Colleges.

REVIEWS.

PRINCIPALS AND PRACTICE OF OBSTETRICS. BY JOSEPH B. DE LEE, A. M., M. D., Professor of Obstetrics at the Northwestern University Medical School. Large Octavo of 1,060 pages, with 913 illustrations, 150 of them in colors. Philadelphia and London; W. B. Saunders Company, 1913. Cloth, $8.00 net.

The work herewith noted must be regarded as one of the most ambitious text-books in this subject which has been issued within recent years. In view of the great number which have been brought out during the past decade, great credit must be given to the author for his courage. Whether there is any need from further obstetrical manuals, remains to be seen. Dr. De Lee acknowledges his indebtedness to Bumm's great work both as to ideas and illustrations, many of the latter having been redrawn from this source. The ideas and opinions expressed are, however, claimed to be mainly the result of the author's own experiences in hospital and private practice. Diagnosis is made a particular feature and likewise the relations of obstetric conditions and accidents to general medicine, surgery and the various specialties.

Dr. De Lee is convinced that we are justified in stating that childbirth at the present time is not a normal process and that for this reason obstetrical art and science should be elevated to a higher plane. He believes that when this is done the subject will be divested of most of its objectionable features and therefore made more inviting to students and physicians. He claims that this will lead the public to appreciate such special service more than in the past.

Dr. De Lee introduces a great many original ideas, many of which will no doubt be objected to and may probably be revised in future editions. Among these is the statement that the fetal brain possesses certain functions relating to voluntary movements, etc. It seems more likely that fetal movements are entirely reflex in character and that no actual nerve impulses radiate from the brain to the spinal centers, for we often find fetuses of the acranial type living for several days after birth.

In certain other theoretical problems the author is not as explicit as might be desirable. Thus the serum diagnosis of pregnancy, which has received so much attention during recent years is not referred to at all. In its more practical aspects, however, the book can be commended and the description of the various therapeutic procedures is reliable and up to date. The pathology of pregnancy, labor and the puerperium occupies a large portion of the book and the discussion of puerperal infection particularly is very satisfactory. In the treatment of the latter condition the author takes a firm stand against all forms of local interference, relying largely on general measures, including fresh air, diet, etc., to accomplish the result. A routine adherence to any specific treatment is contraindicated and likewise extensive surgical procedures. The chapters on operative obstetrics are very complete and satisfactory and regarded as a whole the book constitutes a noteworthy addition to practical manuals on obstetrics.

GOLDEN RULES OF GYNECOLOGY. By GEORGE B. NORBERG, M. D., Professor of Diseases of Women and Clinical Gynecology, University Medical College, Kansas City, Mo., Gynecologist to Kansas City General Hospital, Fellow and Ex-president Kansas City Academy of Medicine. 250 pages, 8vo Price $2.25. St. Louis: C. V. Mosby Company, 1913.

Dr. Norberg's book is an attempt to present gynecologic diagnosis and treatment in a most condensed form, for which reason all references to the work of others has been omitted. The material included in the book is presented in the form of short, concise statements, which are usually convincing but the average reader will be more or less antagonized by the all too frequent repetition of the word "*remember*" at the beginning of sentences. It might better have been left out in this connection without any sacrifice to the general value of the book. The author's diagnostic points are without criticism but one may find fault with many of his suggestions for treatment. Thus in the treatment of puerperal sepsis, which is referred to in the description of metritis, he advises frequent intrauterine douching, a procedure which has been quite generally abandoned. As a general rule, however, the author's directions are based on conservative lines and the book will undoubtedly find a suitable field of employment in general practice. Very complete diagnostic and therapeutic indices are appended to the work, which is well printed but might have been greatly improved by the addition to a few simple and appropriate illustrations.

OCCASIONAL PAPERS ON THE PREVENTION OF SOME COMMON DISEASES IN CHILDHOOD. By J. SIM WALLACE, D. Sc., M. D., L. D. S. Dental Surgeon and Lecturer on Dental Surgery and Pathology London Hospital; Hon. Dental Surgeon, West End Hospital for Nervous Diseases. London: Bailliere, Tindall and Cox, 1912.

The papers included in this little book appeared originally in various medical and dental journals and as they are more or less related a collected publication seemed advisable. It is estimated that at least one-half of the preventable diseases of childhood are due to oral sepsis. The author believes that the diet in infancy and childhood is a most important factor in this condition and that medical men have not given this sufficient recognition. A great many of the traditional feeding methods have been eradicated but most medical men have not adopted new views as largely as they ought. Wallace believes that this is due to the fact that much of this information has appeared in dental journals and books which are not read by physicians. The author's papers are worthy of close attention and it is hoped will assist in bringing about a better mutual understanding between the medical and dental professions.

TEXT-BOOK OF GENERAL AND SPECIAL PATHOLOGY FOR STUDENTS AND PRACTITIONERS. By HENRY T. BROOKS, M. D. Illustrated with 525 half-tone and other text engravings (110 in colors), also 15 full-page plates in colors, containing 40 figures. Philadelphia: F. A. Davis Company, 1912. $5.00 net.

The book herewith presented is the outgrowth of an idea to issue with notes and additions, a translation of the "Grundriss der Pathologischen Anatomie," by the well-known Professor Langerhans of Berlin. The death of the latter and the important and rapid advancements made in this subject prompted the writing of a new treatise in which the illustrations and available portions of the German text were freely employed. Other well-known German authors have also been freely consulted and while the work is intended chiefly to serve medical students as an introduction of the study of pathologic anatomy it is also written to appeal to the practitioner and enable him to intepret clinical symptoms. For this reason practical questions of diagnostic importance are frequently considered. The book is satisfactorily illustrated and being printed on thin paper over 11,00 pages are very comfortably included in a volume not too large for practical use.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Tubal Pregnancy before the Fourth Month. Max Cheval (*Bull. de la Soc. Belge de gyn. et d'obst.*, vol. xxiii, No. 8, 1913) discusses the diagnosis and treatment of tubal pregancy occurring before the fourth month. The symptoms are those of ordinary pregnancy; the physical signs are those of early pregnancy with the addition of enlargement of one tube. The swelling is fusiform and soft. It must be differentiated from pyosalpinx in which there is no true arrest of the menses or violet color of the vulva; from cyst of the ovary which is accompanied by menstrual troubles; from fibromata of tubes and ovaries; from uterine pregnancy. Examination under narcosis will give valuable aid in diagnosis and should always be made before an operation is undertaken. The complications include separation of the ovum, tubal abortion, and ruptured pregnancy. Tubal abortion may occur either into the abdomen, with intraperitoneal hemorrhage, or into the uterus, the ovum being discharged through the vagina. This abortion must be distinguished from ordinary uterine abortion, inflammation of the adnexa, and appendicitis. The diagnosis from ordinary abortion depends on the color of the blood, seat of the pains, and elimination of the membranes containing villous remains. Ruptured pregnancy may occur before or after separation of the ovum, through the pressure of the hemorrhage or by contraction of the tube. The cytolizing action of the placenta softens and weakens the muscular fibers of the tube, causing the tube to rupture easily. This is marked by a sharp pain in the groin, and a chocolate-colored flow, with the elimination of some membranous dèbris, or a severe hemorrhage enlarging the abdomen and causing shock. This peritoneal inundation must be distinguished from peritonitis after perforation. If the hemorrhage is gradual a retrouterine hematocele forms with the ordinary symptoms of plastic peritonitis which accompany hematocele. The diagnosis is difficult since the symptoms of pregnancy often are slight, the ovum being already dead. The symptoms are essentially chronic, but its increase in size may occur in several bursts, as if there had been renewed hemorrhage. This lesion may be absorbed or suppurate. The hematocele may be peritubal or in the broad ligament. The indication is always for operation, never for waiting. The accidents that may occur in a developing extrauterine pregnancy are so severe that operation is always the best course. To refuse to operate on a patient with a thready pulse is wrong. The pulse will be relieved only by the removal of the cause of the hemorrhage. The tube should be removed with the ovum.

Contraction Ring as a Cause of Dystocia.—C. White (*Lancet*, Mar. 1, 1913) says that the contraction ring as a cause of dystocia is one which is neglected in the standard text-books on obstetrics, and the ring itself is frequently confused with the retraction ring of Bandl which forms as a result of obstructed labor. The ring forms over an area of slight resistance and tends to fit into depressions of the child. The wall below the contraction ring is not thinned or overdistended and the presenting part not forced down into the pelvis. In a contraction ring case the fundus, as a rule, is soft and still undergoing contractions and relaxations. Except in rare cases of organic obstruction to dilatation of the cervix (*e.g.*, by carcinoma) a retraction ring is always seen late in the second stage. Several writers state that the retraction ring is more easily palpable per abdomen than a contraction ring, but the contraction ring has frequently been felt on abdominal examination; thus it appears doubtful if this will be of practical help in making a differential diagnosis. When seen early, before being exhausted by fruitless obstetric operations, the patient with a contraction ring is in good condition compared with the exhausted state of a patient with obstructed labor. Premature rupture of the membranes is the most constant etiological factor. Intrauterine manipulations are also very frequent, but unless some intrauterine manipulation had been done the diagnosis could not have been made. It is obviously necessary to presuppose the existence of increased uterine irritability in addition to the two factors mentioned to explain the infrequent occurrence of contraction rings. All forms of malpresentations are common. About 10 per cent. of recorded cases have been delivered of macerated children. A long first stage with weak pains is usual. A contraction ring is twice as common in multiparæ as in primparæ. In well-marked cases one-third of the mothers and one-half of the children die. Three cases of labor with this complication are recorded by the writer. Expectant treatment is useless, as in a severe case the condition persists. Acting on the supposition (probably incorrect) that the condition is one of pure spasm, both chloroform and ether have been tried very fully, but have entirely failed to relax the ring in severe cases. Morphia has failed even in large doses. Chloral hydrate has not been given any extensive trial, but from its action in cases of trismus of the cervix might be of use. Isolated cases are recorded where other drugs have apparently done good, for example, 10 minims of amyl nitrite by inhalation. In the slighter cases manual dilatation of the ring frequently succeeds. "Willett's continuous weight traction" is limited to cephalic or breech presentation. An instrument (*i.e.*, craniotomy forceps) is fixed to the fetus and a weight traction of 6½ pounds suspended. It succeeded well in his case. Forceps are limited to cephalic presentations with the head below the ring. In the more severe cases they fail entirely. Embryotomies for this condition have been extraordinarily difficult from the high position of the head and the difficulty of getting the instruments past the ring. After perforation of the head the shoulders are held back if the ring is round the neck and traction by craniotomy forceps only moves the uterus as a whole. Cleidotomy is, therefore, indicated in every case where the ring is round the neck of a dead child. Cesarean section is indicated where the ring is wholly below a living child. In other cases, if simple traction or manual dilatation fails, it is preferable to embryotomy if the child is alive. In performing the operation it is often difficult to extract the child. Thus all extraperitoneal Cesarean sections are contraindicated, and in septic cases the operations indicated are Cesarean section followed by hysterectomy if the child is alive, or excision of the gravid uterus unopened if the child is dead.

The Pathogenesis and Treatment of Eclampsia.—Jarzew (*Zentralbl. f. Gyn.*, March 1, 1913) has already claimed that the increased viscosity of the blood in eclampsia is an important factor in the production of the disease and believes that this has now been confirmed by the work of Engelman. The general arterial hyperemia results in a condition in the brain which brings about a marked increase in the intracranial pressure and predisposes to convulsions. If there are mechanical disturbances of the circulatory conditions not only a cerebral hyperemia results but a collection of serous fluid occurs in the perivascular spaces on the free surfaces of the brain and in the ventricles. The resulting intracranial pressure is further increased and a convulsion may occur notwithstanding the relatively low arterial pressure and the continuous state of coma. This is more apt to occur in primiparæ because the greater tension in the abdominal walls results in increased compression of the abdominal aorta which interferes with the flow of blood from the brain. Naturally this results in an accumulation of globulins in the blood which, according to Jarzew, explains many of the symptoms of eclampsia. Stroganoff's treatment is rational because the irritability of the cerebrum and the arterial pressure is thus diminished and the liability to new attacks reduced. The placenta is regarded by the author as the active agent in the disturbance and he considers that rapid delivery by Cesarean section is the most rational form of operative treatment. He considers, however, that the good results are due to the loss of blood and the mechanical relief of the cerebral circulation from emptying the uterus. In mild cases without a return of the convulsions and a reduction in the blood pressure full dilatation may be waited for with final delivery by forceps or version. If the convulsions continue and the blood pressure remains high vaginal Cesarean section should be resorted to. In every instance of eclampsia the individual patient should be studied as regards the severity of the disease, the immediate surroundings of the patient and the personal ability of the operator.

Treatment of Brow Presentations.—Lehle (*München. med. Wchnschr*, April 22, 1913) refers to the fact that in over 30,000 labors in Döderlein's clinic in Munich 330 brow presentations occurred. In 70 per cent. of the cases a spontaneous delivery resulted, in the remainder forceps, version and perforation were employed. Fetal asphyxia seems to be the most frequent complication and the mortality directly referable to the position of the fetus was 4.9 per cent. From a study of the labors in this series of cases Lehle concludes that expectant treatment is indicated in the majority of instances. An attempt to do a combined external and internal version should be attempted and if this fails delivery should be attempted with the brow presenting. If no result is obtained the Scanzoni procedure may be resorted to. It is possible in this way to avoid perforation of the living child.

The Value of Pubiotomy.—Kriwsky (*Monatschr. f. Geburtsh. u. Gynäk.*, April, 1913) believes that the collected statistics of this operation warrant us in arriving at certain definite conclusions regarding its value. Although pubiotomy is not a panacea in contracted pelvis it has assumed a definite position among obstetrical operations. In multiparæ with a diminution of the true conjugate which is not below 7 centimeters, the operation must be regarded as comparatively free from danger and the procedure of choice. Experience has also shown that pubiotomy may be done in primiparæ if the only alternative consists of perforation of the living child and other methods of delivery including Cesarean section are not applicable. In such cases the condition of the soft parts must be carefully considered and perineal incisions employed if necessary. Experience has shown that the least dangerous method is that of Döderlein and that labor must be terminated immediately by forceps or version. The aftertreatment does not require any special procedures and a turning of the patient on the side soon after operation is to be recommended. The permanent enlargement of the pelvis in its diameters or elasticity does not often result and this constitutes one of the few unfavorable features in connection with the operation. Even in cases where pubiotomy has been done twice the method of delivery in subsequent labors is uncertain.

Observations on Abderhalden's Pregnancy Reaction.—Schlimpert and Hendry (*München. med. Wchnschr.*, April 1, 1913) present the results of their observations in 316 cases which they divide into two groups, the first of which includes seventy-nine cases in which a more carefully developed technic was pursued and 237 in which the original method developed by Abderhalden was employed. In the first group the pregnant and non-pregnant individuals were equally divided and in no instance was a failure noted. In the original series of tests the results were somewhat more doubtful. The authors conclude that their investigations fully confirm the claims of Abderhalden. Only those results are to be credited which have been confirmed by controls on numerous nonpregnant individuals, for with a faulty technic apparently positive results in pregnant individuals are easily possible. Observations which are not based on the most careful technical requirements have no value as diagnostic features. The authors found that the greatest difficulty in carrying out the test consisted in the impossibility of obtaining placental tissue completely freed of blood. It was found that this could be overcome by using a 0.9 per cent. salt solution. The experiments were limited to the diagnosis of pregnancy and only the dialyzation method was employed. The test of the optical method was reserved for future researches.

The Diagnosis of Pregnancy with the Optical Method and the Dialyzation Procedure.—Freund and Brahm (*München. med. Wchnschr.*, April 11, 1913) present the result of an extended series of tests made in the Chariteè in Berlin, including 141 cases, in which the optical method was used 134 times and the dialyzation procedure twenty-nine times. The patients included normal as well as pathological pregnancies in all months, extrauterine, adnexal tumors and non-pregnant individuals, also several cases of eclampsia. The clinical result was confirmed by the optical reactions in 72.4 per cent. and by the dialyzation experiments in 66.7 per cent. The writers believe that the failures in the observations are due to the changeable character of the placental peptones of the various sera. These variations may change from day to day and lead to the possibility of a negative result. For this reason it is essential in doubtful cases to test out the polarizing power of a serum with a second or third specimen of peptone. Another source of failure resides in the insufficient time of observation employed, for which reason it is recommended that the time for observing the peptone be extended from twenty-four to thirty-six or forty-eight hours. In comparing the dialyzation observations with the optical method an agreement was found in sixty-one cases, forty-three positive and eighteen negative, so that out of the total of ninety-two cases in which this method was employed there were thirty-one which did not confirm the result obtained by the optical method. Notwithstanding these sources of failure and uncertainty Freund and Brahm believe that the method is of great value and simply requires further development before its practical value is established.

The Biological Diagnosis of Pregnancy.—Engelhorn (*München. med. Wchnschr.*, March 18, 1913) has tried out the dialyzation method of Abderhalden in Seitz's clinic in Erlangen with the idea of testing its practicability for purely clinical purposes. Several sources of error were encountered among which the difficulty of preparing the placental material was prominent. Engelhorn with others has found that this tissue is not suitable for the test after eight or ten days. Furthermore it is essential to use perfectly clear serum in order to avoid hemolysis as in those cases the serum itself affords a positive reaction. A total of 108 cases were examined including sixty pregnant and forty-eight nonpregnant women. In eleven pregnant cases the Abderhalden test was negative and positive in thirty-one nonpregnant women. Engelhorn does not believe that the dialyzation procedure of Abderhalden affords a specific reaction and that we are not justified in the negative outcome of the same in making a diagnosis of the absence of pregnancy.

The Later Development of Prematurely Born Children.—Wall (*Monatschr. f. Geburtsh. u. Gynäk.*, April, 1913) has investigated this subject with particular reference to the later development of nervous, psychic and intellectual disturbances, in a series of over 600 cases in Breslau, out of which 183 cases were subsequently traced and subjected to examination. Wall found that the claim often made by neurologists that premature children are predisposed to Little's disease, idiocy, imbecility and epilepsy, is not supported by the subsequent history of the cases. The majority of these children developed in a perfectly normal manner, a part seem to be subjected to a restriction in their bodily add mental development as shown by the delay in acquiring walking and speaking. This developed mental defect is not constant or irreparable It seems as if these children merely required a longer time to overcome the deficiency brought about by the premature delivery. The severity of the symptoms is in reverse proportion to the original weight of these children and stands in a direct relation to the damage to which they were subjected after birth, to the insufficient care and nutrition, to improper hygienic surroundings and to accessory diseases.

GYNECOLOGY AND ABDOMINAL SURGERY.

Senile Involution of the Tubes.—S. H. Geist (*Arch. f. Mik. Anat.*, Bb. lxxxi, Abt. 1), refers to the necessity for distinguishing whether changes found in the tubes after the menopause are due to inflammatory processes or result naturally from the progressive senile involution. The literature on the subject is comparatively sparse. Geist's material included a series of twenty-two specimens from women after the menopause and also several from fetuses, children, young girls and mature women. From a careful microscopical examination of these specimens it appears that the involution which comes on with advancing age affects particularly the mucous layer. The microscopical examination shows that in the latter the minor crypts first disappear. This process goes on until the lumen of the tube presents a mere cleft and is finally obliterated. At the same time a moderate increase in the connective tissue results in the larger folds. The musculature, especially in the outer layer, shows marked degenerative changes including the noticeable development of connective tissue so that these layers are relatively not as thin as the mucous membrane. The elastic tissue which is comparatively little in amount even in mature women, disappears entirely. The vessels in the tubes of old women which have borne children show the same changes as those in the uterus and ovary. The epithelial lining undergoes the most marked changes, both the secretory and the ciliary cells becoming supplanted by cells of an indifferent type. Finally this layer becomes so smooth that it appears like endothelium. Geist believes that the desquamation of the epithelium which has been described by various others is due to postmortem conditions. Although the ciliary cells are usually supplanted as stated, these elements may occasionally be noted until the eightieth year. The first change which occurs is the disappearance of the cilia and in the outer portions of the ciliary cells both large and small nuclei are formed of which the character if still doubtful.

Hematometra in Old Age.—Ottow (*Zentralbl. f. Gyn.*, February 22, 1913) reports an interesting case of this condition in a woman eighty years of age due to a carcinoma of the body of the uterus which resulted in an atresia of the cervix. Only a few cases of this kind have been reported. His patient had six normal labors and went through her menopause at the age of fifty-three without any difficulty. At the age of sixty-eight she suddenly began to have slight genital hemorrhages for which a curetage was done. The bleeding stopped and nothing further was seen until eleven years later when a sudden and severe vaginal hemorrhage resulted which was stopped with a tampon. Within six months the woman presented evidences of an extensive carcinomatosis with metastatic deposits. The writer believes that in his case bleeding had undoubtedly taken place for a considerable period before a relief from the condition of atresia provided an outlet for the accumulated blood. The curetage undoubtedly predisposed to the agglutination of the cervix.

Ovarian Alterations in Mole and Chorioepithelioma.—G. Pusinich (*Folia Gyn.* vol. vii., fasc. iii, 1913) gives the history and histological examination of the specimens from a case of uterine mole, in which the two ovaries were transformed into cystic bodies. The mechanism of the formation of those cysts was this: they have the same structure as atresic follicles, and are a direct emanation from them. The epithelial cells of the theca interna have a tendency to be pushed to the periphery, while the connective tissue is gradually stretched; as the cavity enlarges there is a secretion of considerable fluid in the follicle. This is favored by the laxity of the walls, the easy imbibition of serous fluid, and the numerous lutein cells which insinuate themselves between the layers of tissue. Thus these cysts may be called lutein follicular cysts. The follicular atresia results from the hyperemic state of the internal genital organs; this is marked during pregnancy; it is observed especially in the ovaries of osteomalacia. This degeneration is also noted in chronic peritonitis, tubal pregnancy, myoma uteri, uterine cancer, and gonococcic salpingitis. The author concludes that cystic lutein-follicular degeneration occurs frequently in conditions of hyperemia of the genital organs; that this is not dissimilar from that found in mole and chorioepithelioma, in which the process becomes marked. Operation should be recommended only after a careful consideration of clinical symptoms which are consecutive to mole and chorioepithelioma, since the growth is often entirely benign.

Vesicular Mole in the Uterus.—C. Sauvage (*Ann. de gyn. et Obst.*, April, 1913) says that in many cases operation is performed for the removal of the uterus which contains a vesicular mole when in reality there is no absolute necessity of operation. These growths do not necessarily undergo malignant degeneration. The author has carefully examined a mole which was removed under the belief that there was a large uterine fibroid. The patient recovered. He gives certain conclusions as to the evolution of the ovum toward vesiculation of the chorial villi and transformation into a mole. There were present in the specimen indications of a previous glandular metritis and hypertrophy. Still this is a benign change. In the ovary there was present one ovule which was about to rupture. Thus it would seem that ovulation continues during the evolution of this abnormal gestation. A relationship is established between the presence of the corpora lutea and polycystic transformation of the ovaries which is found in many cases of mole. The degeneration of the center of a corpus luteum may be interpreted as the beginning of a transformation into a cyst.

Prognostic Value of the Leukocyte Count in Pelvic Suppurative Conditions.—J. T. Smith (*Surg. Gyn. and Obst.*, 1913, xvi, 403) states that the leukocyte counts in pelvic suppurative conditions are extremely variable. In a series of 100 such cases, the leukocyte counts were decidedly of more prognostic value than the preoperative temperatures. With pus in the pelvis and a leukocytosis above 14,000, some trouble arose during the convalescence in a majority of 100 cases. With pus in the pelvis and a white count of less than 14,000 trouble developed during the convalescence in only a small minority of 100 cases.

Operations on the Mammary Gland.—Since 1898, 534 patients have been operated on in the German Hospital clinic for tumor of the breast, as follows: carcinoma, 370; fibroepithelial, 123; chronic mastitis, 24; sarcoma, 11; tuberculosis, 6. An analysis of the last 200 cases of carcinoma and 100 cases of fibroepithelial tumors of which the records are complete, with the end-results of all cases which we are able to trace, forms the material from which J .B. Deaver's(*Jour. A. M A.*, 1913, lx, 795) statistics are computed. Benign tumors are said to constitute 11 per cent. of all breast tumors, of which 7 per cent. are of the fibroepithelial type. A growth may appear clinically and pathologically benign when already in a small area malignant transformation has taken place. Thirty-seven of the relatives of the author's patients with malignant growths, and twenty-two of those with benign growths died of cancer, 13 per cent. of each type affecting the breast. The occurrence of mammary carcinoma in four or more members of a family, a history given in two of the cases, would indicate hereditary influence, but this must be considered a development la predisposition. When a positive diagnosis of mammary carcinoma can be made, the hope of operative cure is often in vain, for the classical signs are usually unmistakable evidence of extensive metastasis. In 65 per cent. of the malignant cases and 25 per cent. of the fibroepithelial type the patients suffered pain from several months to several years after the discovery of the tumor. The initial symptoms in cases of cancer and of fibroepithelioma included a lump in 78 per cent. of the former and 86 per cent. of the latter; pain in 9 per cent. and 10 per cent. respectively. The opportune time for surgery in mammary carcinoma is in the presence of a symptomless, freely movable mass. That patients are rarely seen in this stage of the disease is indicated by the physical signs. The cases of cancer and of fibroepithelial tumors showed mobility in 78.5 per cent. and 99 per cent. respectively; skin involvement in 70.5 and 3 per cent.; retraction of the nipple in 53.5 and 5 per cent.; discharge from the nipple in 3 and 1 per cent.; ulceration in 15.5 and 1 per cent.; and involvement of axillary lymph nodes in 37 and 9 per cent. The writer draws attention to the frequent occurrence of a gain in weight of women with cancer of the breast incidental to metabolic changes with the menopause. In this series both malignant and benign tumors were found most frequently in the upper and outer portions of the breast. Palpably enlarged axillary or supraclavicular lymph nodes in the presence of a mammary growth do not necessarily mean carcinomatous involvement. In both chronic cystic mastitis and cancer, these nodes undergo certain changes affecting especially their germinal centers, and leading to hypertrophy, which has been styled the precancerous adenopathy. Palpable axillary nodes were noted in nine benign cases and proved free of malignant change by microscopic examination. The writer has noted apparent recurrence twenty years after removal of a cancerous breast. Most of the so-called late recurrences are new processes without relationship to the previous trouble. Röntgen irradiation has no place in the treatment of operable carcinoma of the breast. As a prophylactic measure against postoperative recurrence, or in cases of local recurrence which on account of the position and extent of the growth or the debilitated state of the patient preclude further operative interference, and in inoperable cases of cancer of the breast the *x*-ray is the only therapeutic measure of value. With the radical operation the average primary mortality is about 1 per cent. Of patients well after three or more years, only 12 per cent. had retraction of the nipple, and 18 per cent. attachment of the tumor to the skin, but in no instance was the tumor attached to the pectoral fascia. Of forty patients with enlarged supraclavicular glands, only two survived. Of the fifty-nine patients dying of early recurrence 90.9 per cent. had palpable axillary involvement. Of sixteen living after the hree-year limit, 25 per cent .had palpable lymph nodes in the axilla. The statistics of end-results in 119 cases indicate that approximately one patient in five is permanently relieved of mammary carcinoma by the radical operation, though the inability to secure reliable data makes even this percentage questionable. This percentage would probably be materially lessened if the patients with cases pronounced inoperable, whose names do not appear on hospital records, were included in the statistics.

Tuberculosis of the Urinary System in Women.—E. H. Richardson (*Bull. Johns Hopkins Hosp.*, 1913, xxiv, 103) says that renal tuberculosis is the most frequent of all suppurative diseases of the kidney from twenty to forty years of age. Unexplained cystitis, even of a mild grade, in a young person should of itself excite suspicion of tuberculosis. An insidious onset is of distinct diagnostic value. The general physical examination will not infrequently disclose a primary focus elsewhere in the body. Locally one finds in many cases a sensitive kidney; a sensitive ureter on abdominal palpation just over the point where it crosses the pelvic brim; on vaginal examination the thickened, beaded ureter easily indentified traversing the anterolateral fornix; and the infiltrated, hypersensitive trigonum. The bladder capacity is greatly reduced— a contracted, irritable viscus, intolerant of any instrumentation. The cystitis is of a type that resists or may even be aggravated by treatment with irrigations, especially if silver salts are used. A persistent acid pyuria is present from which no organism grows on ordinary media and the tubercle bacillus may be demonstrated in the urine. The cystoscopic findings and the comparative functional tests furnish indispensable information. The radiograhpic disclosures may prove of great assistance, especially when intensified by the preliminary introduction into the renal pelvis of some substance impervious to the rays, such as collargol. One may profitably resort to the use of tuberculin as a diagnostic measure in properly selected cases. If the surgeon is still uncertain as to the competency of the supposedly healthy kidney, it is perfectly legitimate to investigate it through an exploratory lumbar incision before removing its diseased fellow. No matter at what stage the disease is discovered, or how extensive the bladder involvement, provided only it is unilateral so far as the kidneys are concerned, nephrectomy—nephroureterectomy, if the ureter is extensively diseased—should be promptly performed. If but one kidney is slightly involved while the other is practically destroyed or converted into a pus sac, the latter should still be removed or first drained and later removed, and the patient's health will generally be benefited as a result. If there is still some secretory tissue left in the worse damaged kidney of a patient afflicted with advanced bilateral disease, nephrostomy with establishment of a permanent lumbar fistula, is a useful palliative measure. After removal of the diseased kidney in cases of unilateral infection the bladder involvement will heal spontaneously in nearly all cases. This may be hastened by appropriate treatment. If only a single focus exists in the bladder, or if there are multiple discrete ulcers, it is helpful to apply the actual cautery or strong silver nitrate. It is still better to excise the ulcerated area when possible. If the disease is too extensive to be successfully treated by these methods, instillations of iodoform—olive-oil emulsion, or of carbolic acid, or of bichloride of mercury are of distinct value. In cases of bilateral disease, in inoperable cases, and as a postoperative measure in advanced bladder tuberculosis, tuberculin should certainly be given a cautious trial therapeutically. Pregnancy aggravates renal tuberculosis. Generally speaking, if the disease is unilateral, nephrectomy should be done and the pregnancy be allowed to go on undisturbed, but bilateral involvement is an indication for abortion.

Perineorrhaphy with the Figure-of-eight Suture.—C. G. Child, Jr. (*Jour. A. M. A.*, 1913, lx, 894) employs silkworm-gut and the following technic. The vaginal sutures are passed and tied in the usual manner. In the perineum a figure-of-eight suture is used, the first bite of which catches up the levator ani muscles, and the second bite the transverse perineal muscles and skin. Care should be taken in tying these sutures not to bring them too tightly together, or they will cut deeply into the tissues and be difficult to remove. The ends are left long and all sutures are removed on the tenth day. The advantages claimed for this method are: 1. High percentage of primary union. 2. Perfect approximation with the obliteration of all "dead" space. 3. Fewer sutures with a consequent minimization of interference with nutrition to the tissues. 4. No buried sutures of uncertain strength and questionable sterility, with a low power of resistance to infection and an uncertain period of absorbability, but removable sutures of unquestionable strength, nonabsorbable, noninfectible and absolutely sterilizable.

Operation for Cancer of the Cervix Uteri.—G. Gellhorn (*Surg., Gyn. and Obst.*, 1913, xvi, 284) says that the vaginal method lends itself, most of all, to the rather large category of old, fat, or cachectic patients and those suffering from heart disease. In very early cases of cervical cancer, both methods should be considered on equal terms. In squamous cell cancer, the vaginal operation should be given preference; in adenocarcinoma, the abdominal method. In moderately advanced cases, where the uterus is not freely movable, the abdominal operation should be the method of choice. In this latter class of cases, where the uterus does not follow downward traction and the ureters are surrounded by cancerous tissues, the vaginal method meets with excessive difficulties, and consequently yields poorer ultimate results.

DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATIONS.

PROPHYLAXIS OF SUMMER DIARRHEA.

BY

CHARLES GILMORE KERLEY, M. D.,
New York.

What is necessary to prevent the large infant mortality from summer diarrhea is easily told. The working out of the problem among the masses is another matter. In my private work among babies which is by no means small, a death from summer diarrhea is most exceptional. I have not lost a case in years. This shows that a considerable mortality is unnecessary. Our greatest success rests in prevention. I impress upon my mothers the necessity of keeping the baby's digestive tract in a normal state every day in the year. Every infant's food is adjusted so as to insure this.

Susceptibility to gastrointestinal disorders due to a diminished resistance is a most important predisposing factor in summer mortality. An infant with habitual digestive disturbances with or without associated malnutrition is an easy mark for infection or any unfavorable condition. This explains why the mortality of June and July usually exceeds that of August and September. The susceptible and the weaklings readily succumb.

Food Supply.—As a general proposition milk food should be pasteurized during the hot months among all classes, especially among the poorer people to whom the best milk is not available and the means of properly keeping it are inadequate. Further milk which has been subjected to the influence of heat is easier of digestion. Every mother and nurse under my direction is instructed not only how to prepare and care for the milk but it is impressed upon her the necessity of feeding lightly on hot days. One or two ounces are thrown out of each bottle and the amount replaced with water. The mother further is told not to expect the child to gain much in weight during the summer. I aim not to overfeed. The weight chart is often a means of much danger. I do not permit their use. Many deplorable effects may be attributed to the weight chart.

The mother feels that the child must keep time with the chart. He is often pushed beyond his digestive capacity and trouble more or less serious, results.

A green stool is regarded as a danger signal. Castor oil is to be given no matter how trivial that disorder and water or a cereal decoction follows for a day or two, and when milk is resumed it is given in small amounts, the regular formula being diluted with barley water. It is a safe assertion that nearly all children are overclad in hot weather. Defective heat radiation is a factor of no little etiological importance in summer diarrhea. A knit belly band and a cheese-cloth napkin constitutes the wearing apparel on very hot and humid days. Two or three spongings a day with cool water adds much to the child's comfort. The patient is kept very quiet and not manipulated or handled. Infants with weak digestion are often given substitutes for fresh cow's milk during the hot months. Not all of my infant patients go to the country or the seashore. The comforts of a fairly well-appointed home in the city possesses advantages over the cramped quarters of the cheaper hotels and boarding houses.

The carrying out of these suggestions gives a mortality of practically zero, and you remark that nothing very remarkable has been suggested. Nothing is furnished the child that he has not the right to demand, viz., fresh air, bathing, clean suitable food, properly prepared, cared for and given, right clothing, ordinary animal requirements, and with the exception of clothing, what we give to all young animals of value. The large infant mortality of which most is said and written is not due to city life, congestion of population or heat. These of course are contributing factors. The mortality is large outside of the great cities. The basic causes of infants' deaths are ignorance in the parents and indifference on the part of the state. What is required to save infant lives is a propoganda of instruction in the simple details of child management.

When the state realizes that infant lives are worth saving, then measures will be taken to lower infant mortality.

Babies' welfare work, Health Departments and various civic and private associations are doing much to remedy existing defects but they only scratch the surface and are operative in spots. Infant mortality from diarrheal diseases and other diseases is exceedingly large in smaller cities, villages and in the country as well as in arger cities. Ignorance is operative wherever it exists and it exists everywhere as regards child management. The results that may be obtained by correct management of infant life has never been demonstrated better than by W. H. Park in this city a few years ago. Fifty tenement children ranging from three to nine months of age, were selected for the experiment. These children were all fed on the Straus milk. They were visited two or three times a week by physicians especially assigned to them. The mothers were carefully instructed as to the care of the milk, the feeding apparatus, and in other necessary details. With the first signs of illness, the milk was to be stopped, the physician notified, and suitable treatment instituted. Among these fifty tenement children, all under one year of age, all bottle fed, selected at random, there was not one death during the summer. This valuable observation bears out my contention which I demonstrated years ago that the deaths of summer diarrhea among tenement children may be greatly reduced by the use of good milk adequately cared for and given under proper supervision, supplemented by prompt and competent medical care at the first sign of illness. Perhaps in 1 per cent. of the cases of summer diarrhea a very severe direct infection is evident, and the condition of the patient very grave from the onset. In the remainder the invasion is gradual; and, if the warnings are heeded, the illness will usually terminate quickly in recovery.

In the work of the Health Department under Dr. Josephine Baker among 16,000 children supervised from the time of birth until one year of age by 150 nurses, there was but 1 per cent. mortality.

If child life is worth saving in the large city, small cities, country villages or on the farm it can only be effectively done on a large scale through state control through dividing the cities, villages and open country into districts each for a certain number of inhabitants, each district being in charge of a person or persons clothed with authority and possessing knowledge sufficient to see that every child gets simple animal necessities and protection, and the work of such persons will be largely that of teachers and the detail work should be done by women who must know the language of those with whom they come in contact.

You may say that I am arguing for socialism or paternalism. Name it as you will it is the only way in which our high infant mortality from various diseases will be curtailed in this or any other country.

Private societies and various local organizations for the benefit of mankind cover comparatively small territory, usually have a feverish existence and burn out. Every child represents an asset to the state and must be under effective state supervision and by such means only will infant mortality be appreciably lowered.

132 West Eighty-first Street.

MEDICINAL TREATMENT OF SUMMER DIARRHEA.*

BY
WALTER LESTER CARR, M. D.,
New York City.

The medicinal treatment of summer diarrhea becomes an important part of its therapeutic management when there is neglect of preventive measures. So long as babies are fed on impure milk or other food that causes intestinal irritation or acts as a conveyer of pathogenic bacteria there will be need of medicinal treatment.

In the treatment of summer diarrhea our objects are: (1) To aid nature in her efforts to clear the stomach and intestine of the material that is the source of irritation; (2) to lessen the effect of gastroenteric irritability and general toxemia; (3) to sustain strength and aid digestive processes; and (4) to restore the normal functions of the intestine.

Treatment for these conditions may be medicinal, but medicine alone cannot save life if common sense judgment in management is not used.

In mild cases of acute gastroenteric infection—summer diarrhea—an important inaugural treatment is the rapid emptying of the stomach and intestine. If the stomach is loaded with food, stomach washing with sterile water is essential and colon irrigation is important. Added to these, medicinal agents, such as caster oil and calomel are of value and have not been replaced by newer drugs. Castor oil, in 1 or 2 dram doses, given every hour for three doses, will cause a more complete emptying of the intestinal folds than one large dose. Babies and young children will take *cold* castor oil of good quality without repugnance, but they will not take luke-warm oil without gagging. Dram doses of castor oil are useful after twelve or fourteen hours if the movements show particles of food with mucus, or mucus alone.

Calomel, in doses of 1/10 to 1/5 grain, with 1/2 grain of sodium bicarbonate every half hour for five to eight doses, is a helpful addition to the initial castor oil, and is useful when the movements show an imperfect bile flow, and fatty or cheesy masses in the stools, with offensive odor. Calomel may be given instead of the castor oil if the stomach is irritable, in the doses mentioned. Saline cathartics are not well borne by babies and I seldom resort to them.

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* Read as part of a symposium, before the Medical Society of the County of New York, May 26, 1913.

Paregoric, in one dose of five to eight drops, may be added to the castor oil, or given separately if there is much discomfort with colicky pains. One dose will not interfere with the action of the castor oil, but it should not be repeated until the intestine is cleared.

If the tongue is dry and the evidences of intestinal irritability continue after the elimination of the food that has been the source of disturbance, calomel, in 1/20 grain doses, with 1/2 grain of soda and 1 grain of salol, should be given every hour for four to six doses. The effect of salol in the dose mentioned is to lessen intestinal fermentation, and of the calomel, to stimulate bile flow—a natural antiseptic.

It is not difficult to sustain strength and restore digestive power in cases of acute eliminative or fermentative diarrhea, and the indications are met most frequently without drugs if the stomach and intestine are not further disturbed by the use of food that was primarily at fault. Hot or cool water, according to the condition of the child's stomach, will be valuable to carry from the system the products of the interrupted metabolism. Peptonized gruels, malt soup or malt foods, made without, or with very little, milk, will lessen the work of the gastric mucous membrane. When milk is resumed as an article of diet, the fat and casein should be eliminated as much as possible, and the soluble albumins, such as fat-free whey or a lactic acid fat-free buttermilk, administered. There is no doubt that cultures of lactic acid bacilli assist intestinal digestion during convalescence from this type of summer diarrhea, and a fresh culture of lactic acid milk has a definite action in restoring intestinal power.

Salol in 1 grain doses three times a day, with or without 1/20 grain of calomel, will prove beneficial if there is intestinal distention, or distention and light colored stools.

Castor oil in doses of half a dram may be administered at night if the movements are lumpy and contain shreds or particles of mucus.

Bismuth—subcarbonate, subnitrate, or subgallate—in doses of 5 to 10 grains, is of value for watery stools after the acute symptoms are past. It may be given with castor oil or in an emulsion. The subgallate of bismuth is the best form of the drug where the intestine shows evidence of being relaxed. Bismuth does not create disturbance, and if the preparation is pure it may be given in the doses indicated.

Resorcin, in doses of 1/4 to 1/2 grain, finds favor with many physicians, but I do not use it as much as formerly, as I failed to get much effect from it in cases with intestinal fermentation.

In severe cases of summer diarrhea with a decided toxemia, there are manifestations that are not always relieved at once by stomach washings, colon irrigations, castor oil, or calomel. Such cases have not only vomiting, diarrhea and purging, but also continued fever, restlessness, irritability and exhaustion—in part occasioned by the effects of the poison on the nerve centers.

Elimination must be carried out as outlined, but if there is a decided systemic invasion, the symptoms of toxemia require particular attention, not all medicinal. Colon irrigations of sterile salt water, 1 dram to 1 pint, at a temperature of 105° to 110° F. should be given every two or three hours. Siphoning, if done carefully and slowly, is better that the usual method of high tubing. Three to four ounces of the last fluid used may be left in the intestine, if there is great exhaustion, but there should be no pressure of the fluid in the intestine. Careful bathing, the administration of small doses of cool water, heat to the feet, and quiet will accomplish much in lessening the severity of the toxemia of an acute gastroenteric infection.

Opium will be required in severe cases if the irritability of the intestine is not relieved by the means employed to empty and cleanse it. The deodorized tincture of opium should be given by mouth in 1/4 to 1/2 minim doses, once in two or three hours; or by rectum in doses of 1 to 2 minims, with mucilage of starch, 1/2 ounce to 1 ounce. Opium is not to be used until the intestine is clear of offending food particles. If there is great exhaustion, with purging and vomiting, 1/50 grain of morphia with 1/600 grain of atropia should be given hypodermatically, instead of waiting for the effect of the opium by mouth or rectum. Whenever opium in any form is given to babies or children it should be watched and the dose repeated as indicated, not by a prescription order. Such doses must be administered with care and supervision, as the effect of the opium on the nervous system should be a minimum and not a maximum one.

Stomach medication is to be limited to small doses of stimulant, three to five drops of brandy once an hour, given if the circulation is poor, the face pinched, the fontanel depressed, or the subcutaneous tissues show an absence of fluid. The stimulant should be administered in hot water if possible, or, in extreme cases, with saline injections.

In the secondary infections following summer diarrhea, brandy and whiskey will be serviceable, but they should not be depended upon to the exclusion of food. Alcohol as a medicine is not to be given in ordinary fermentative or eliminative diarrhea, and only a thoughtless practitioner will advise it. In the protracted cases of exhaustion associated with intestinal indigestion and diarrhea due to improper bottle feeding, it may have some value, but the value does not make up for mismanagement in handling and preparing the milk for infant feeding. Alcohol in the form of brandy will be needed in those cases where there is poor circulation and defective oxygenation, and a dose of five to ten drops three times a day will be better borne than a bitter tincture and the effect will be much more satisfactory.

The alcohol in essences of pepsin and pancreatin may explain what is at times claimed as the "digestive power" of the preparations. In infants and young children, I expect little effect from essence of pepsin, but I believe there is value in pancreatic preparations independent of the alcohol.

Camphor, as the spirits of camphor, in doses of one-half to one drop once in three or four hours, with five drops of aromatic spirits of ammonia will, if there is depression of the circulation and of the nervous system, tide over periods of weakness, particularly when there have been frequent serous discharges.

Strychnine, in doses of gr. 1/500 to 1/300, may be given when the circulation is poor and the heart shows the effect of exhaustion and of serous drain. The hypodermic use of strychnine is not often called for in summer diarrhea, but it is desirable to have it ready for cases in weak babies depleted by a long illness. In doses of gr. 1/600 to 1/300, it may be repeated as indicated but care should be taken that the needle does not add to the sufferings of the patient.

Caffein, in doses or 1/36 to 1/24 grain is serviceable when there is depression.

Black coffee, in ten- to twenty-drop doses, once in two hours, is helpful in cases of loss of vitality.

To restore the normal function of the stomach and intestine, after a severe attack of summer diarrhea, requires more care than is usually given. Not only must the food be regulated in quantity and in kind, but medicines may be required to aid digestion. Two or three drops of dilute hydrochloric acid in water, three times a day, is helpful in patients with a lowered gastric action. If the stools are light in color from a deficient bile flow, 1/10 to 1/5 grain of calomel at night will assist intestinal digestion. Pancreatization of food before it is taken into the stomach will lessen the tax on stomach digestion, and prepare the way for intestinal absorption. Brandy in small doses, three times a day, with one drop of tincture of nux vomica, will be serviceable. Whiskey may be used in place of the brandy, as a good whiskey is more readily purchased than a good brandy, but its effect on the intestine does not seem to be so satisfactory.

Iron preparations are not demanded except for the secondary anemia observed in some children who will be benefited by iron in two- to three-drop doses of the tincture of the chloride of iron well diluted.

A small proportion of cases with highly colored urine and intestinal distention need alkaline treatment, such as two grain doses of bicarbonate of soda. Five grain doses of citrate of soda in water three or four times a day may be needed to assist kidney elimination and prevent nephritic disease.

Most cases of summer diarrhea recover with little medication but, as stated, medicine will be required for patients who have severe exhaustion, toxemia, intestinal indigestion, anemia, and kidney disturbance.

SUMMARY.

1. Castor oil and calomel are valuable early in summer diarrhea, to get rid of offending material in the intestine, and when symptoms of intestinal irritation recur.

(2) Opium is not to be used except when the frequent stools of a diarrhea exhaust a child and interfere with a rational routine of management.

(3) Intestinal antiseptics, such as salol and bismuth, have a place in the treatment of summer diarrhea where there are secondary intestinal symptoms.

(4) Agents to increase digestive power and bacterial preparations that add to the protective force of the intestinal flora limit the time of convalescence and diminish the waste from diarrhea.

(5) Alcohol, camphor, caffein, and strychnin assist nature in limiting the exhaustion consequent upon a protracted diarrhea or a toxemia, but are not of any value unless there is careful dietetic treatment.

(6) Vaccines or sera have not shown that they retard the course of summer diarrhea, but they seem to have lessened some of the

severe symptoms in cases with systemic invasion of pathogenic organisms.

(7) Drugs are most needed when the prophylaxis of summer diarrhea is neglected and the diet is not regulated.

68 West Fifty-first Street.

TRANSACTIONS OF THE MEDICAL SOCIETY OF THE COUNTY OF NEW YORK.

Meeting of May 26, 1913.

The President, Brooks H. Wells, M. D., *in the Chair.*

PLANS FOR THE REDUCTION OF INFANT MORTALITY.

Dr. Ernst J. Lederle, Commissioner of Health, first reviewed briefly the history of that function of the Health Department relating to the reduction of infant mortality. He recalled that, in 1876, the Department having recorded an unusually high mortality among infants applied for and obtained a special appropriation for the employment of a staff of physicians during the months of July and August. These physicians were known as the "Summer Corps" and were assigned to duty in the tenement districts where they treated all sick babies whose parents were unable to obtain medical attention. This work followed for many years had, no doubt, been a factor in decreasing the number of infant deaths during the past thirty years but its effectiveness was limited because its purpose was limited to the treatment of sick babies rather than to the prevention of illness.

The work of prevention was begun in 1902 when seventeen trained nurses were employed by the Department to assist the Summer Corps and to instruct mothers in the proper method of preparing food for babies and in demonstrating the correct principles of bathing, clothing and airing.

With the establishment of a special division of Child Hygiene in 1908 the summer work for babies became an important function of the new division. In May of that year a Conference was organized in an effort to coordinate and make more effective the work of public and private agencies. This was the same idea that was later carried out by the Babies' Welfare Association organized in 1912. It was now possible to undertake lectures on the care of babies each week at the various recreation piers, public playgrounds, and other social centers throughout the city. In cooperation with private agencies the Department had assigned medical inspectors to the infant milk stations conducted by the Brooklyn Children's Aid Society and the New York Diet Kitchen Association in 1909, 1910, and 1911. The organization of Little Mothers clubs had been successfully developed among public school girls.

In 1911 another important step was taken in the establishment of municipal milk stations. Successful as the summer work had been the ideal of the department was to treat infant mortality all the year around. An experimental appropriation for the establishment of fifteen infants' milk stations to be operated throughout the year was an important step in this direction. The New York Milk Committee and other private agencies operated a much larger number of stations and the result of these combined efforts was so encouraging that an additional approbriation for 1912 was granted sufficient to increase the number of milk stations to fifty-five. These stations are now in full working order. At each milk station a nurse is on duty all of the time, and a doctor is on duty two days each week. On May 1, fifty-five additional nurses were appointed for the extra work in these milk stations which the department will have to do during the summer months. The milk stations are, as far as possible, encouraging breast feeding, and the number of mothers who come to the stations in order to obtain milk for themselves so that they may nurse their babies is encouragingly large.

Beginning July 1, all of the nurses who are doing school work will be assigned to duty in the instruction of mothers in the care of infants. Each nurse will be given 150 babies to care for, and will be assigned to duty in a district which is not already covered by the activities of an infants' milk station. This custom has been followed for the past two years, with great success, the nurse visiting the baby as soon as possible after it is born and keeping it under continued observation during the heated term. Each morning each group of two of three nurses meets the inspector and consults with him regarding delicate or ill babies. If a child is not normal the inspector visits it himself and thereafter refers it to the proper dispensary or hospital for treatment, if such medical care is needed.

Beginning the third week in May, lectures on the Care of Babies will be given in all of the public schools of the city to all girls over twelve years of age, the object being to enlist the sympathy and support of the girls of the city in the department's campaign to reduce infant mortality. For the past three years these lectures have been given each spring and have been followed by the formation of so-called "Little Mothers Leagues" which have been kept together during the summer by having lectures and demonstrations given to them each week by the doctors and nurses of the Department of Health.

During the past year the cooperation between the Department of Health, through the Division of Child Hygiene, and the other agencies of the city engaged in baby welfare work, has been enormously increased. About eighty different agencies in the city engaged in baby welfare work have formed a federation known as the Babies' Welfare Association, with a central clearing house for information and co-operation at the Department of Health. The advance in effective work which has been possible under such cooperation has been very great, with a corresponding elimination of duplication of effort.

In addition to the specific preventive work, the efforts of the Department were constantly directed toward raising the sanitary quality of New York's milk supply which constituted an important factor in lowering the infantile death rate. Under the strenuous campaign for pasteurized milk which the Department had directed the percentage of pasteurized milk to the total supply had risen from 15 per cent. to 50 per cent. in two years. The latest step was the adoption of the requirement that cream should be pasteurized after July 1, 1913.

Dr. Lederle exhibited charts showing the death rates among infants in the ten largest cities of the State, that of New York being 105.2 per 1000 births which was only surpassed by Rochester with a rate of 97.7, while Troy recorded a rate of 157.4 Another chart showed the annual death rate per 1000 population under one year of age, based on estimated population at that age for the years since 1902, and inclusive of 1902, when the death rate was 44.28, while for 1912 it was 26.39. During five of the years since 1902 the rate had exceeded that of 1902. The rate for 1911 was 30.68 while for 1910 it was 47.97. It seemed evident from these figures that the efforts of the Health Department together with those of other agencies had been responsible for this great drop in the mortality rate among infants.

A CLASSIFICATION OF THE SUMMER DIARRHEAS IN INFANCY.

Dr. Henry Koplik said that the term "summer diarrhea" was really a purely seasonal nomenclature of the intestinal disturbances that he was asked to consider and the term was incorrect inasmuch as the diarrheas which were prevalent during the summer could be shown to exist during the rest of the year. The summer diarrheas were a set of intestinal disturbances varying from a mild dyspepsia to the most fatal choleraic diarrheas which were prevalent at all seasons. They occurred almost exclusively in the bottle-fed infants and left the breast-fed infant practically immune. Dr. Koplik said that his paper, therefore, considered for the most part the conditions met with in the artificially fed infants.

The American Pediatric Society as far back as 1894 made an attempt to formulate a classification of the so-called diarrheal diseases of infancy. Even to-day their views were under discussion. It might be said that the whole series of intestinal disturbances which showed no pronounced lesion of the intestinal tract *postmortem* belonged to the class of intestinal disturbance which they were now considering. A classification of the gastrointestinal disturbances prevalent during the summer months would vary according to the pathological nature of the disturbances in the intestine alone. The classification of the various forms of summer diarrheas might be etiological, or mixed etiological and climatological as reflected in the American and English literature. The whole subject of classification was in its formative period and would remain so until new facts had been uncovered from time to time to complete their knowledge, actual as well as theoretical, of these diarrheas and intestinal disturbances of infancy. No classification of any disease could be said to be complete until it rested upon the firm basis of pathological and pathogenic knowledge. This could not be said to be the case in the summer diarrheas; therefore, any form of classification to-day was temporary only. These intestinal disturbances which they were considering were found with reservations among artificially fed infants; and for this reason the first great step in their elucidation was taken by the Czerny school who made a study of the food itself as an etiological factor in the causation of this class of diarrheas, and elaborated the theory of food injuries to the intestine. The analysis and classification from the point of the gross food might be subdivided into the disturbances caused by the various causative elements of the food. A concentrated mixture of wholesome fats, carbohydrates, or cereal might be a most dangerous weapon against the well-being of the infant. The first element of a disturbing food would be the fats if present in unsuitable quantities. The sugars were looked upon as irritants in certain forms of intestinal fermentation. The sugars derived from the cow's milk were irritating. The carbohydrates in the form of cereal added to the food were an etiological factor in the causation of dyspeptic disturbances such as a pronounced acidity, flatulence, loss or stationary weight, constipation, and finally diarrhea and vomiting with progressive emaciation. To the thoughtful the idea of a "food irritant" was nothing new. Rotch when he was perfecting his percentage feeding, insisted that some infants might thrive on a wholesome food of certain percentages of fat, casein and sugar, while others might be poisoned by the same food. The old idea that casein must be present in a proportion not much above that of human breast milk (Meiggs and others) had been given a more liberal interpretation to-day and much larger amounts of casein were admittedly well borne; but it had been shown recently that a too high percentage of proteins was not well borne and gave rise to many alimentary disturbances, such as had been described by Vaughan when proteins were injected in concentrated form into animals. Elaborating upon the Czerny food injury to the intestine, Heubner and his associates (Finkelstein and others) endeavored to show the way in which food acted as an irritant and though no new facts were contained in these later day theories, an attempt was made of a purely clinical classification of the summer diarrheas or functional diarrheas based upon the various elements of the basic food, milk, as an irritant when introduced in some unsuitable way into the intestine. Heubner had attempted to show that in introducing unsuitable food elements into the stomach and intestine, the process resulted in an acid fermentation and late excretion in the stomach, the energy being expended in elaborating the food for absorption, and this was abnormal; there was at first a waste of energy, then a disturbance of metabolic processes due to the presence of a foreign body in the form of unsuitable food and finally from mild dyspeptic phenomena a series of symptoms such as the fermentative formation of gases and increase of abnormal secretions, diarrhea, and final catastrophy. Finkelstein had gone a step further and had tried to evolve a classification of sets of cases in which the injuries due to the various elements of food could be treated clinically. He divided his cases of diarrheas into those which began in a series of symptoms of the mildest forms of stomach and intestinal dyspepsia; then the symptoms of decomposition and finally those of a severe intoxication. He had tried to divide his cases into those which showed merely the dyspeptic symptoms such as mild fever, flatulence, increased colic, diarrhea, and then he went further to those cases which showed the presence of intestinal decomposition and toxemia, fever, etc., plain symptoms of involvement of the kidneys and other organs, as well as diarrhea, and finally the cases in which there was a condition of complete decomposition of the food in the intestine. He laid much stress on the fact that the fats and sugars were causes of an infinite variety of troubles and insisted that the casein had never, in his observation, been a source of trouble to the infant. He believed that their rôle had been much overestimated and a classification on the ground of the introduction into the body of bacterial elements as a causation of diarrhea had obscured the main cause of all the trouble, the food itself. Escherich divided the diarrheas of infancy into those due to external causes of infection, bacteria introduced into the food from without, and those due to bacteria in the food itself. The classification of the term "summer diarrhea" as he had pointed out, Dr. Koplik said found its excuse in the fact alone that during the summer months these diarrheas in artificially fed infants were especially prevalent. Why? Was it the intense heat? If so, why was it that the heat could scarcely be said to affect the breast-fed infant to any extent? Why should the artificially fed infant alone suffer? Many theories had been offered and many had been rejected. It was the bottle infant that had a resistance of vitality much below that of the breast-fed. There was some unknown and unexplained causation between evaporation from the surface of the body and body energy and the capacity for assimilation. This explained why in the cooler months infants could assimilate stronger food with a larger proportion of fat and other elements of food than in the summer months. The laity even recognized these facts. Dr. Koplik said that he felt that in the next ten years the theories which held the minds of students today must give way to more definite data when their clinical, physiological and pathological methods had undergone a refinement and perfection to-day unknown.

PROPHYLAXIS OF SUMMER DIARRHEA.*

DR. CHARLES GILMORE KERLEY read this paper.

MEDICINAL TREATMENT OF SUMMER DIARRHEA.†

DR. WALTER LESTER CARR read this paper.

PRESENTATION OF CHILDREN'S PROCTOSCOPE.

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* For orginal article see pape 149.

† For orgina article see page 152.

DR. FRANK C. YEOMANS presented

A CHILDREN'S PROCTOSCOPE.

This is modelled after his pneumoelectric proctoscope. The same system of lighting is employed and the ocular end is provided with an air tight magnifying window, having a connection for the attachment of a bulb to dilate the bowel with air. The tube is 10 inches long, of 1/2 inch diameter and is graduated in inches. As the distal end of the tube is very smooth it can be introduced into the bowel of children, even as young as one year, as far as the apex of the sigmoid without causing pain or trauma. No anesthesia is employed and the child is placed in the Sims' position or held in the knee-chest posture during the examination.

Doctor Yeomans has found the instrument especially useful in examining children for rectal bleeding to determine its cause when due to multiple polypi or a single polypus with high insertion of the pedicle, also to recognize prolapse of the sigmoid and enlarged sigmoid (Hirchprung's disease) as well as for topical applications.

TRANSACTIONS OF THE AMERICAN PEDIATRIC SOCIETY.

Meeting of May 5, 6 and 7, 1913.

The President, JOHN LOVETT MORSE, M. D., *in the Chair.*

THE PRESIDENT'S ADDRESS: WHOOPING-COUGH. A PLEA FOR MORE EFFICIENT PUBLIC REGULATIONS RELATIVE TO THE CONTROL OF THIS MOST SERIOUS AND FATAL DISEASE.

According to the mortality statistics compiled by the United States Census Bureau in 1906 from a registration area comprising slightly less than one-half of the population of the United States, there were 6,324 deaths from whooping-cough among children under five years of age. The United States Public Health Reports showed that in 1910 the death rate per 100,000 was as follows: Whooping-cough, 11.4 per cent.; scarlet fever, 11.6 per cent.; measles, 12.3 per cent.; diphtheria, 3.4 per cent.

The author communicated with the Boards of Health of a considerable number of cities scattered all over the United States relative to the incidents and control of whooping-cough and had received replies from sixty-one. The death rate from whooping-cough was, on the whole, greater in the large cities than in the small. All the statistics show that whooping-cough was a serious and fatal disease. He had inquired what was being done in this country to limit the spread and diminish the death rate from this dread disease and had found that surprisingly little effort was being made in this direction. Whooping-cough was a notifiable disease in only twenty-nine of the forty-three states that had answered his inquiry. Isolation was required by law in seven states and "modified isolation" in two others. That there was almost no provision for the hospital treatment of whooping-cough in this country. In New York there was a special ward for children with whooping-cough at Bellevue, but only those having complications were admitted. There were also two isolation cottages at Randall's Island. With these exceptions there were practically no hospital accommodations for cases of whooping-cough. The recent investigation of Mallory had proved conclusively that the Bordet-Gengou bacillus was the cause of whooping-cough and that the organism was present between the cilia of the epithelium lining the trachea and bronchi. It had been found in the sputum as late as the eighth week of the spasmodic stage. It was fair to assume, therefore, that the disease was transmitted by the secretions of the respiratory tract and that it was contagious throughout the whole of the spasmodic stage.

The isolation and recognition of the organism by cultures was, however, too complicated a procedure for practical everyday use. An agglutination reaction was present in many cases, but was not constant and was usually not very high. Its presence was proof of whooping-cough; its absence did not count much against it. The frequency of the reaction increased with the duration of the disease. The complement fixation reaction should be of great service in the recognition of abortive and atypical cases in exceptional circumstances, when such recognition was of great importance. There was an increase in the total number of white corpuscles with an absolute and relative increase in the number of lymphocytes in the catarrhal stage of whooping-cough. This blood formula was a fairly constant one in whooping-cough and was therefore of considerable diagnostic importance. In the immediate future and probably for many years to come it was reasonable to suppose that, because of the indefiniteness of the early symptoms and the frequency of mild types of the disease, almost everyone would sooner or later have whooping-cough. The important thing was to prevent babies and young children from having the disease. To prevent this they should convince physicians and the public in general of the seriousness of whooping-cough in young infants and young children and of the importance of protecting them from it.

Whooping-cough must be made everywhere a reportable disease. The house should be placarded and the inmates instructed by the health authorities as to the seriousness of this disease in infancy. The sputum and vomitus should be treated in the same way as in tuberculosis. The patient should be separated from other children in the family if the latter are under five years of age. There was no reason why children should be isolated and not allowed to go out of doors, provided they were kept away from other children. They should be required to wear an arm band of some prescribed color and labelled "whooping-cough" in large letters. The vitality of the Bordet-Gengou bacillus outside of the body being slight, formal disinfection was not necessary. The other children should not be allowed to attend school unless they had already had the disease or until two weeks had elapsed since the last exposure, provided they were free from catarrhal symptoms. The community should be required to establish hospitals for children not properly isolated at home and for those who could not be properly treated in their homes. When these recommendations were carried out whooping-cough would cease to be the scourge that it now was.

THE DIAGNOSIS AND TREATMENT OF PYELITIS IN INFANCY.

Dr. Rowland G. Freeman, New York.—The pyelitis of infancy which was a fairly common disease was generally understood by pediatricians as a disease characterized by active remitting temperature, and was treated most successfully by the use of alkalies, while some cases might be cured by urotropin in doses of 1/2 to 2 grains every three hours. Recent experiences had led him to believe that such statements should be materially modified and that the pyelitis of infancy was a disease which was usually characterized by a high remitting temperature but might give rise to no temperature, and that while some cases might be cured safely by neutralization of the urine with alkalies and other cases by doses of urotropin such as those named that the most efficient treatment in difficult cases was by the use of very large doses of urotropin aided by vaccines, either commercial or autogenous.

Pyelitis in infancy is due to the invasion of the pelvis of the kidney by colon bacilli resulting in a purulent inflammation. Vaccines either autogenous or commercial were useful in controlling the constitutional symptoms. Hexamethylenamin while sometimes effective in doses of 1/2 to 2 grains several times a day would not in these doses cure certain cases which could be controlled by very large doses. Hexamethylenamin should always be administered in small doses first, but the dose should be rapidly run up, the child and its urine being carefully watched for symptoms of irritation of the kidney. Large doses of hexamethylenamin should not usually be continued for more than a week at a time, and then for several days there should be no treatment or alkaline treatment. It should be started at the maximum dose given before and the amount increased daily until an influence on the urine was obtained. Doses of 25 grains in a child of six months and from 35 to 45 grains a day in a child of from nine to twelve months might be safely given in this way.

DISCUSSION.

Dr. Walter Lester Carr of New York stated that the effect of urotropin in small doses was sometimes remarkable in causing irritation. In regard to the use of vaccines he recalled one case in a child of six years in which the treatment was not started early. High irrigations were given and the temperature dropped; if vaccines had been given the drop in temperature would have been attributed to the vaccines. The rises in temperature in this condition were intermittent.

Dr. Thomas S. Southworth of New York said some of the cases of pyelitis go on without a rise in temperature while others might have a continuously high temperature.

Dr. Henry I. Bowditch of Boston asked whether they had tested the urine for a reaction during the administration of urotropin. In Dr. Talbot's work they had concluded that urotropin or hexamethylenamin acted only when it broke up into formaldehyde and this happened in acid urine but only to a very slight extent in alkaline. The small doses, the gradual increase and the periodicity of the treatment were very interesting.

Dr. Freeman was afraid of urotropin. He had used it in one child and each time after the administration the child became cyanotic. He had not used autogenous vaccines but had obtained good results with the commercial vaccines.

PANCREATIC INSUFFICIENCY IN CHILDREN.

Dr. Langley Porter of San Francisco, California, described this condition as characterized by indigestion of acute onset and protracted course with marked wasting occurring in the second half of infancy and in early childhood. The indigestion was revealed by frequent, bulky, pale gray, greasy evacuations which contained a great deal of wasted fat which was found as free fat, fatty acids, or as a combination of the two. The diarrheal discharges were usually not frequent; the loss in weight was not rapid; there was usually considerable flatulence. There was a moderate or marked fall in hemoglobin, the temperature was normal or subnormal, and the appetite was unimpaired. There was a general concensus of opinion that if more than one-third of the fat ingested appeared in the stools unsplit, or even if such a proportion carried material quantities of fatty acids, the steapsin of the pancreas might be considered to be either insufficient or inefficient. The few cases that showed deficiency of fat splitting could be explained on the ground that there was a partial or complete blocking of the pancreatic duct by that group of glands which lay about the head of the pancreas, where inflammation or enlargement would affect the duct. It seemed also to be clearly demonstrated that the pancreatic lipase, amylase, or protease might be diminished in quantity or power while the other secretions were doing their work in a normal manner.

After discussing the various infecting agencies and the microscopical picture presented by the pancreatic ducts he said that the autopsy in one of his cases and the evidences that he had brought forth made it reasonable to assume that in the cases of patients whose stools showed marked increase in free fat waste, definite depression of those digestive powers usually attributed to the pancreas, and the predominence of abnormal bacteria, such as were described by Herter, the ducts of Vater, and through them the pancreatic tissue had been invaded by these abnormal organisms, and that there had been an answering protective inflammatory reaction in the gland which had damaged its secretory power, and impaired the digestive quality of its juice. The fact that many of these cases automatically recovered was not an argument against this contention. The material presented in the paper was too scanty to expect conclusions drawn from it to be accepted as final; the paper was prepared in the hope that others might consider it worth while to investigate the condition from this point of view. The question of the value of vaccines in such a condition was brought up because in one case the results following the use of a vaccine were so striking that it seemed impossible that mere coincidence would explain them. It was not suggested that one certain organism was specific for this condition; it seemed quite reasonable that any pathogenic bacterium or even the colon bacillus, under abnormal intestinal conditions, might become the incitor of a pancreatitis leading to a suppression of deficiency in one or other of the pancreatic ferments.

Undoubtedly a large number of cases in this group were mild and transitory and would respond to such dietetic measures as made the intestines an ungrateful field for the growth of the organism pathogenic for the particular case.

A RAPID CLINICAL METHOD FOR THE ESTIMATION OF TOTAL FAT IN THE INFANT'S STOOLS.

Dr. David Murray Cowie and Dr. Winfield Scott Hubbard of Ann Arbor said that the ideal method for the estimation of fat in infants' stools was that which determined neutral fat, fatty acids, soaps, and total fat, as they existed in the stool before it came in contact with external agencies. Such a method adapted to clinical needs did not at present exist. Such a method they believed had a definite value. It would be of greater value if it could be applied to fresh or moist as well as pulverized stools. The following method which they presented sought first to convert all fats into fatty acids and subsequently to bring them into the graduated neck of a tube by rapid centrifugalization. They had adapted their test to the glassware in common use. If pulverized stool was examined 1/4 of a gram was used; if fresh or moist stool 1/2 gram. The sample was carefully rubbed with a little water in a mortar with a thin lip, using a total of 20 c.c. of water to transfer the mixture to a Babcock bottle graduated in fiftieths of a centimeter. They next added 17.5 c.c. sulphuric acid with a specific gravity of 1.84 and mixed the whole thoroughly. They then added 1 centimeter amyl alcohol (Kita), again mixed thoroughly and centrifugalized at a high speed for three minutes. The fat column was brought into the neck of the tube with hot water. It was centrifugalized for one minute and *read while hot*. The number of divisions on the neck of the tube occupied by the fat was then multiplied by the factor 7.2 if a 1/4 gram sample had been used, by 3.6 if 1/2 gram was used. The result represented the percentage of fat in the sample.

IS DIPHTHERIA FREQUENTLY A BACTEREMIA?

Dr. Matthias Nicoll, Jr., and Dr. H. L. Wilcox.—Condari and Bierast had called attention to the fact that while diphtheria had been regarded chiefly as a local disease, yet the Loeffler bacillus had frequently been isolated from the blood and organs during life. On account of the technical and other difficulties of obtaining a sufficiently large quantity of blood from diphtheria patients, the writers thought to have solved the problem of diphtheria bacteremia by an examination of the urine of those actively ill and of convalescents. In all, 155 patients were examined, of which fifty-four showed a positive urine. In six cases only were virulence tests made, all of which proved positive. Of the fifty-four positive cases, thirty-two were female and twenty-two male; thirty-six were children and eighteen adults. Thirty-one urines were taken in the first week of the illness, ten in the second, five in the third and two in the fourth. One was found positive in the ninth week of convalescence. The urine, 20 to 30 c.c. in amount, was taken by means of a catheter with every precaution to insure sterility and the centrifugalized sediment spread over one or two Loeffler plates and plates of Conradi and Troch. Both Loeffler's and Neisser's stain were used for identification. The bacteria were found in normal as well as albuminous urine showing that they passed through healthy as well as diseased kidneys. In most cases they were very few in number. On the strength of their findings the authors made a plea for the disinfection of the urine of convalescents, until by three negative cultures it was shown to be free from the diphtheria bacillus. They suggested that diphtheria of the skin and mucous membrane, which showed such a predilection for the genital and anal regions, was due to direct infection from the urine. The authors reviewed the results of similar investigation by Dr. R. Koch of Franfort who examined ill urines from twenty-six patients. They also reviewed the work of Walter Beyer whose results were little short of startling. He examined nineteen cases of diphtheria daily or every second day from the active stage to late convalescence. Practically every urine examined showed diphtheria bacilli at each examination, their number being greatest during the active stage of the disease and gradually diminishing. In the case of eight convalescents, four of whom had recovered from their illness three and one-quarter to three and one-half months previously, and the others eight, six, five and four weeks, respectively, the urine showed the continued presence of diphtheria bacilli, six strains of which were said to have been virulent for guinea-pigs, the other two avirulent. After analyzing their findings they concluded that diphtheria bacilli might occasionally gain access to the blood and be excreted in the urine in very severe cases of diphtheria with marked ulceration of the mucous membrane of the pharynx and tonsils. This fact was of theoretical interest, but of little practical importance to the physician. They believed that the identification of diphtheria bacilli in the urine should not rest on morphological characteristics, but be confirmed by isolation and animal inoculation controlled by the use of diphtheria antitoxin.

THE AMMONIACAL DIAPER AND ITS CORRECTION.

DR. THOMAS S. SOUTHWORTH of New York.—The occurrence and persistence of a strong ammoniacal odor upon an infant's diaper was noted with sufficient frequency to remove it from the category of great rarities. It had usually been ascribed to decomposition of the urine after its passage. No one of their American text-books offered suggestions for its correction and it was probable that the condition has not received any general attention. The five cases which the writer reported permitted the deduction that in infancy a noticeable ammoniacal odor to the diapers might yield either to the administration of alkalies, or to a reduction of the fat in the milk mixture, or to a combination of both measures. The conclusions in regard to the etiology of the presence of ammonia in the urine in excessive quantities were according to Keller and Czerny that ammonia did not appear in the urine in normal infants in sufficient quantities to make its presence known by the odor. Such an odor was a concomitant of digestive disturbance, although it by no means appeared in all such cases. Under normal conditions a considerable portion of the nitrogenous constituents of the food was transformed in the organism into ammonia compounds and then converted into urea and excreted as the latter in the urine. A large part of the urea was found in the liver. Changes in that organ were commonly found in gastrointestinal cases and these changes might interfere with urea formation and lead to the excretion of large quantities of ammonia in the urine. The increase in the ammonia excretion could have another explanation, which depended upon the chemical property of ammonia to combine with acids as an alkaline base. Under abnormal conditions there was an excess of unoxidized acids for whose neutralization the available supply of fixed alkalies did not suffice; the ammonia then took the place of fixed alkalies and formed with the acids ammonia salts, which would be excreted in the urine. As the ammonia salts in the urine increased, the urea was correspondingly decreased and *vice versa*. Therefore an increased excretion of ammonia could be caused by an increased production and excretion of acids, except that the abnormal presence of acids might arise from two sources either from an increased production from the products of metabolism, or from an increased formation or decreased absorption in the intestinal tract. This complicated the problem if the acids were present in excess, for if they were not oxidized they were neutralized either by calling upon the fixed alkalies or by calling the ammonia into requisition. Therefore, the condition of the infant and the type of food were important in determining the amount of ammonia excretion. It had been found that the fats were the element in the food to increase ammonia excretion through the formation of fatty acids. The amount of ammonia excretion might be increased or decreased by a variation in the amount of fats.

Where there was enough ammonia in the urine to reveal its presence by its odor, there was also a loss of the fixed alkalies. The less available alkalies taken into the body the greater the necessary abstraction of alkali from the tissues. The therapy of excessive ammonia excretion must therefore be directed toward two ends: First, to prevent the improper formation of acids; and, second, to prevent undue loss of alkalinity. The latter could be partially effected through the administration of alkalies by the mouth. A rather limited experience led him to believe that calcium, magnesium and perhaps potassium were better bases for this alkaline treatment than sodium. The second and more fundamental measure was to promote a better metabolism of the fats by reducing the amount with which the organism was called upon to cope. The food should be such as to be fully digested and oxidized with the least formation of acid product. In persistent and long-standing cases in which a completely fat free milk did not effect a cure they had found it advisable to use a malt soup mixture of readily absorbable carbohydrates. More attention should be paid than had been in the past to the ammoniacal diaper as a clinical sign. It directed the attention to a disturbance of metabolism, presumably traceable to an actual or relative overfeeding with the fat of cow's milk.

DISCUSSION.

DR. DAVID MURRAY COWIE of Ann Harbor, Mich., said they made a routine examination for acetone in cases with ammoniacal stools. Sodium chloride and acetic acid were the final test as to the amount of ammonia present. The examination of the urine should include not only the test for albumin, casts and sugar, but also for the acid bodies.

DR. SOUTHWORTH, in closing the discussion, said he only wished to emphasize the importance of noticing the ammonia in the urine; in most instances it was not necessary to use the elaborate methods to test for this ammonia.

DUODENAL ULCER IN INFANCY.

DR. L. EMMETT HOLT of New York.—Four cases of duodenal ulcer had recently come under his observation at the Babies' Hospital. After giving a brief history of the cases, Dr. Holt stated that all of these ulcers when examined at autopsy were found in the same situation, that was, just below the pyloric ring and in the posterior wall. In size they averaged about 1 centimeter in diameter. They were all round punched-out ulcers; there was no inflammatory reaction; there were no signs of repair, and the base was necrotic. Duodenal ulcers until recently had been supposed to be exceedingly rare in infancy and childhood. Since 1903 groups of cases had been published by several writers, and during the past two years the increasing number of reports indicated that the condition was not at all uncommon, but had been previously overlooked. As compared with gastric ulcers, duodenal ulcers were relatively common. In 1908 Entz of Budapest in 364 autopsies in infants found ten cases of duodenal ulcer and only one of gastric ulcer. Helmholz while working in various European hospitals found sixteen cases in six months. Schmidt reported in 1,109 autopsies in infants during the first year of life twenty cases of duodenal ulcer. The site of the ulcers was quite uniform, being in the great majority of cases just below the pyloric ring. In about one-third of the cases multiple ulcers were present, usually only two or three. The ulcers varied from 2 to 3 millimeters in diameter, were usually circular with sharply defined edges, and had the characteristic punched-out appearance. In about one-fifth of the cases reported perforation had taken place. The cause of the ulcers had been generally assumed to be a thrombosis, then necrosis, and subsequently a self-digestion of the intestine by the acid gastric juice, as it had been noted that practically all the ulcers were above the papilla. Duodenal ulcers had been found associated with melena in the first few days of life. In such cases the ulcers were usually small and multiple. The cause here was assumed to be septic thrombosis. Again a causal connection had been assumed between duodenal ulcers and marasmus and infantile atrophy. Helmholz attached much importance to this view but Dr. Holt said he regarded this connection as an accidental one. Probably the lowered vitality of the intestinal mucosa of such children was a strong predisposing factor. It was rather interesting that in not a single one of the reported cases in infants had duodenal ulcer been associated with burns although Perry and Shaw in 149 autopsies upon cases of burns in adults and older children found five with duodenal ulcer. Collins reported a frequent association of duodenal ulcer with nephritis. The various views indicated how diverse were the opinions which had been held regarding the pathological association of this condition. The probabilities were that none of these had a very close connection. The diagnosis during life was extremely difficult and was made in but a very small proportion of the cases. In Schmidt's twenty cases it was made only twice. In many instances the only symptom of peritonitis was acute collapse followed in a few hours by death. The vomiting of blood, either clear or coffee ground material, was seen in a small proportion of cases. It was noteworthy that both hemorrhage and perforation might be the cause of an acute collapse; the hemorrhage being in many cases internal a diagnosis between these conditions was impossible. The sudden development of acute perforative peritonitis in an infant should lead one to think of duodenal ulcer. In one of his cases the passage of the duodenal catheter led to a diagnosis of the existence of duodenal ulcer which was confirmed at autopsy. There could have been no reason for suspecting that the passage of the catheter was the cause of the ulcer. This means of diagnosis would be a valuable addition to their means of recognizing these cases. Spontaneous recovery occurred in a small number of cases, how often this occurred it was impossible to say, for only the most careful examination of the intestine would reveal the cicatrix of an ulcer. It might fairly be assumed that this condition was fatal in the great majority of cases. There was little to be said regarding treatment. With the uncertainty of diagnosis which existed at the present surgical treatment was practically out of the question. It should be urged upon those who see autopsies on infants to make a careful and systematic search of the duodenum with a view of determining the presence of ulcers which might readily be overlooked in a superficial examination of this part of the intestine.

DISCUSSION.

Dr. F. S. Churchill of Chicago said that of course in the case in which Dr. Holt had passed the duodenal catheter there has been no injury or perforation. He would like to know whether it would be advisable to pass the duodenal tube if one suspected the presence of duodenal ulcer.

Dr. J. Crozier Griffith of Philadelphia said that two years ago he had reported two cases of duodenal ulcer and that of another child that died of hemorrhage and perforation. He had looked up the literature and some cases had been reported since that time. The condition was much more frequent than was supposed, especially in the new-born. Many cases of melena were probably due to duodenal ulcer. If they had found it more frequent in older infants, they had found it more often than he had. Fischer had said that gastric ulcer was extremely rare and duodenal ulcer more so.

Dr. Godfrey Pisek said that as to the condition being the result of thrombosis he would like to cite an instance. He did an autopsy on a child that had died suddenly after he had made a tentative diagnosis of duodenal ulcer. The child showed the characteristic punched out ulcer and the only conclusion was that it was caused by thrombosis which might occur from marasmus or other causes.

Dr. Maynard Ladd of Boston suggested the use of the bismuth meal and the *x*-ray as a diagnostic aid since it had been used successfully in adults.

Dr. Edward E. Graham of Philadelphia had a case in Philadelphia of an infant which was suddenly taken ill, went into collapse, and died soon after he saw it. The case was a coroner's case and the autopsy revealed a gastric ulcer.

Dr. H. M. McClannahan of Omaha, Neb., wished to add a case to the literature of gastric ulcer. He was free to confess that the diagnosis had been made at the postmortem. The child died suddenly in a state of collapse from profuse hemorrhage from the bowels.

Dr. Matthias Nicoll of New York said it was a sad commentary on the pathologist who made autopsies in the routine way and had never seen any duodenal ulcers. He wondered if they had failed to look for the trouble or whether they were difficult to recognize that they had been passed over.

Dr. Holt, in closing the discussion, said that large ulcers were probably not overlooked by anyone, but there might be a large area of mucous membrane affected, but with no perforation or hemorrhage and this might not be recognized. The risk of passing the duodenal catheter were considerable, but if the ulcer was close under the pyloric ring it was well protected and there was little danger.

CASEIN IN INFANT FEEDING; EXPERIMENTS IN EXACT PERCENTAGES.

DR. HENRY I. BOWDITCH of Boston. Up to this time the percentage of proteids, especially casein in milks and formulæ had not been emphasized as much as would seem right. It had been taken for granted that they were fairly exact and constant. One had merely to examine for casein and albumin in creams and milks to find that the quantity of casein varied considerably as did the albumins. If this were true it would be natural to expect a considerable discrepancy in casein formulæ or mixtures made from creams and milks. Milks made up according to the Finkelstein formulæ were examined on the Boston Floating Hospital during the summer of 1912 and they were surprised to find that the supposedly same formula of three consecutive days gave a variation of from 2 1/2 to 4 1/2 per cent. proteid. In making the tests for the amount of casein the method used was that developed by Van Slyke and Bosworth of the New York Agricultural Experiment Station in Geneva. Its operation required only from ten to fifteen minutes and the results were reasonably accurate, usually coming within 0.1 to 0.2 per cent. of the correct amount. This method offered the simplest and most inexpensive equipment and furthermore was eminently practical in the hands of the medical student. The total proteid was determined by Kjeldahl's method and Phoul's modification as a control. The difference between the casein percentage determined and the total proteid had been accepted as the percentage of albumins other than casein. Specimens of 32 per cent. cream, 16 per cent. cream, 4 per cent. cream, whole milk, fat-free milk, and wheys were examined to test their uniformity. These products were taken from the same herd and handled by the same men so that the results were uniform. The casein showed the greatest variation in the creams, from 1.2 per cent. to 1.5 in 32 per cent. cream; from 1.5 to 0.7 in the 16 per cent. cream, while 4 per cent. milk and fat-free milk gave only 0.1 per cent. variation. In looking at the soluble albumins they found that the higher creams had still wider variations. The question arose as to whether this discrepancy in the daily percentage strength of proteids in 32 per cent. cream and 16 per cent. cream affected their formulæ. The chart exhibited showed that the total proteid determined in every instance varied from the proteid in the formula, the total proteid determined being lower than were supposedly ordered. The greater variations were seen in the high fat formulæ. In other words in twenty formulæ taken at random ordered by various physicians the total proteid was barely what was ordered by 0.1 to 0.5 per cent. These errors in the percentage of casein in formulæ could be met in one of two ways. 1. The casein in the cream and milk, as well as other ingredients necessary for the formulæ could be determined and proper allowance made so that the percentage of proteid was accurate. 2. The casein percentage might be estimated in creams necessary for the formula and dried casein might be added to the desired amount. They took a given case and tried the two experiments. 1. They used casein estimated volumetrically and to this added any excess required in the dry form. They further endeavored to ascertain whether there was any difference between the nitrogen intake and output, and further whether the dried casein was digested or not. They found that the above methods of accuracy tallied about evenly as far as intake, retention and excretion were concerned whether the casein was taken wet or dry and powdered; that the dried precipitate casein could be taken without harm and was practically digested by the organism. This procedure or accurate determination of proteids might or might not be of service; this was yet to be determined. The precipitated casein was prepared in the following way: The curds derived from making whey from the necessary formulæ were saved. The curd was dissolved in alkali and precipitated with diluted acetic acid. Large volumes of water were used in diluting the alkali so that the acid added was very weak. The precipitate was collected, washed thoroughly, filtered, squeezed in a cheese press, washed with alcohol to extract the water and the alcohol evaporated, the dry mass was then powdered and passed through a fine sieve. Analysis of this casein gave 98 per cent. casein and 0.2 per cent. salts.

THE INFLUENCE OF VARIATIONS OF DIET UPON GASTRIC MOTILITY IN INFANTS.

DR. MAYNARD LADD of Boston.—Radiographs of an infant's stomach, taken at regular intervals after a bismuth meal, offered a new and interesting method of studying gastric motility. By means of serial views they might obtain exact data not only of the time required for complete emptying of the stomach, but of the rate at which the food was expelled. By varying the composition of the food, an opinion might be formed of the effect of the different milk elements upon gastric motility. Moreover if the same conditions of the experiment were maintained, they might determine differences in the effects of certain formulæ in several babies of approximately the same age. In a paper which he had recently read before the Tristate Medical Association at Norfolk, Va., he had given the results of his observation of gastric motility based upon a series of fourteen infants, making a series of twenty-four experiments, in which about 124 radiographs were taken. Since that time he had increased the number of observations by about 100; so that the ideas embodied in this paper were based upon approximately 225 radiographs of infants' stomachs, showing various stages of digestion. Factors taken into account in making these observations were the age of the child, the quantity of food administered, the composition of the food as shown by variations in the percentages of its elements, by alteration in its reaction, by the addition of such ingredients as whey, barely water, etc., by the use of precipitated caseins instead of the natural proteins of milk—all these might be factors influencing gastric motility. Then, again, there were the individual peculiarities of the child. One of the first points observed in these radiographs was the curious lack of peristalsis to be seen in the normal infant's stomach, as compared with that of adults. The stomach appeared to squeeze out its food by contracting as a whole upon its contents; seldom showing the marked indentations so characteristic of the peristaltic wave in the adult. In the normal case some of the food appeared in the small intestine as soon after feeding as the plate could be taken. The emptying process went on rapidly at first, the major part of the contents being expelled in from one and one-half to two and one-half hours, both in breast-fed and bottle-fed babies. After two hours the emptying process was relatively slow in the majority of cases, often requiring from four and one-half to five and one-half hours before all traces of bismuth had disappeared. In one case and that a normal baby there was a considerable residue of food after seven and one-half hours. This relative inactivity of the stomach after two hours appeared to be due in part to the character of the food and in part to the lack of sufficient distention of the stomach, which seemed to be a factor in stimulating peristalsis. If an infant was given a second bismuth feeding three hours after the first the new feeding did not mix inimately with the bismuth residue of the earlier feeding, but appeared to stimulate the contractions of the stomach as a whole, and the expulsion of the bismuth residue was accelerated, by the new feeding. If the new feeding was given so soon that the stomach had not had time to get rid of a large part of the first feeding, the overdistention which resulted produced a condition of inactivity or stasis and the emptying time of the stomach was prolonged. This interesting action of the stomach was an important factor in explaining why the results of feeding infants at short intervals, such as two and two and one-half hours, might in some babies be successful and in others not. The normal emptying time even in breast-fed infants taking the same quantity of food, varied within wide limits. He had not found as yet an infant whose stomach was emptied in two hours. It was an exceptional case when the stomach was emptied before three and one-half hours. The statement that the stomach of a breast-fed infant was emptied in two and of a bottle-fed infant in three hours was not even approximately exact. The advocates of four-hour feedings, on the other hand, were mistaken in assuming that such an interval allowed the stomach one hour of complete rest between feedings. In many cases there was nearly as much residue after four as after three hours. This was particularly true if the formula contained high percentages of casein. That the bismuth alone might account for the apparent residue in these cases was disproven by careful observation. Experiments showed that in the case of the proteins, it was quite evident that the amount of casein, when it was in a coagulable form was the most important factor in delaying the emptying time of the stomach. The suggestion was strong that the casein of cow's milk, when given in a high percentage, had a decided action in delaying the emptying of the stomach. If this casein was precipitated outside the body, the emptying time was greatly accelerated. The presence of fat had no retarding action, and, in some cases seemed to favor the exit of the stomach contents. There was reason to believe that barley starch rendered the food more easy of exit. Dr. Ladd gave a lantern slide exhibition illustrating his paper.

DISCUSSION.

Dr. Edward E. Graham of Philadelphia said that the subject of gastric motility was interesting to all. It seemed to him that one should be careful as to conclusions. The radiograph was likely to show the bismuth meal remaining in the stomach much longer than the ordinary meal usually remained. Some bismuth meals left the stomach in two and one-half hours but in the majority which he had subjected to test the tendency was for the bismuth to remain longer than when a subsequent meal was given and he doubted whether they could get an accurate conclusion on such a basis.

Dr. Godfrey R. Pisek of New York asked what the position of the children were when the pictures were taken. He said that he agreed with the writer on many points but disagreed on some. Dr. Ladd's work was illuminating and the possibility of error so small that it could be checked up. The *x*-ray observations were different from laboratory investigations in that the child was in a perfectly natural condition.

Dr. F. S. Churchill of Chicago asked the quantity of the test meal and how long it remained in the stomach where the breast milk was tested.

Dr. J. Crozier Griffith asked what was the average ratio of the casein to the proteid.

Dr. Henry I. Bowditch of Boston replied that the average of casein to proteid was quite constant being 2.3 or 2.4 and the albumin being 0.9. He called attention to the waste of material in making up the eiweiss milk. They had used the curds by drying and grinding them and found that the curds from 48 or 50 quarts of milk make 2 or 3 pounds of dry casein which was worth about a dollar so that the saving in the course of a year would be considerable. Feeding with dry casein had almost instantly cleared up gastric symptoms in some instances. It should be remembered that the casein was soluble in an alkali, as lime water.

Dr. Ladd, in closing the discussion, said that the pictures had been taken with the children lying on the stomach and in the intervals between the exposures they had been on their backs. The quantity given for the meal was 5 ounces in two cases and 6 in the third, the baby being heavier. The child taking the largest amount had the longest emptying time.

PELLAGRA.

Dr. Samuel S. Adams of Washington, D. C., presented this case, a child of three years. The child had been in good health until February of this year when a painful rash appeared and persisted for about a week. The child continued to remain mopy, however, and about March 1 the lassitude increased, the child complained of pain in her head and of her hands and feet which were swollen and inflamed. Calomel and bromides were given but the latter only seemed to increase her restlessness. A number of physicians had seen the case and had suggested various diagnoses, among which were anemia and tuberculous meningitis. Dr. Adams said that he was now confident that the child had pellagra. The temperature was normal with a tendency to subnormal. She cried out when her hands were touched and for a time kept them elevated over her head. Her hands became red to the wrists when exposed to the cold and the same was true of her feet upon which there were deep red spots looking likd like threatened gangrene. He had thought of angioneurotic edema and of erythromalalgia. Phenic acid had been given. He had a man in the Georgetown Hospital with pellagra but the symptoms were not similar. The petechial spots still remained. The child, however, was improved.

Dr. Low of Florida said that the dermatitis was almost typical of pellagra and the nervousness was rather characteristic but in a child it was difficult to judge of the mental depression. He would consider the case one of mild pellagra.

Dr. Thompson S. Wescott of Philadelphia said that if the trouble was pellagra unless a radical change was made in the diet it would return at about the same period that it appeared this year. Constipation might be quite as characteristic of pellagra as diarrhea. He asked if corn flour was the cause of the condition.

Dr. Laurence R. DeBuys of New Orleans said that the diarrheal symptoms were wanting and also the discoloration so frequently found but it looked to him like a mild case of pellagra. The child had probably passed the crisis of the disease.

Dr. Adams said the child had had no corn-flour foods and was much better than she had been.

ACUTE INFECTIOUS JAUNDICE IN CHILDREN.

Dr. Charles Herrman of New York.—This form of jaundice in children had all the characteristics of an acute infectious disease. Many text-books spoke of it as gastric duodenitis due principally to indiscretions in diet. The infectious material as yet unknown seemed to have an affinity for the bile passages in the same sense that the typhoid bacillus had for follicular structures. The present report was based on ninety-eight cases seen during a period of six years chiefly at the Vanderbilt Clinic and the Lebanon Hospital Dispensary. As to age incidence no cases had been reported under one year of age; between one and two years of age the disease was uncommon; between three and six years of age it was most common; after that the disease gradually diminished in frequency as the age advanced. Acute infectious jaundice had a seasonal incidence, being more prevalent during October, November, and December; one-half of the cases occurred during these months.

This was a strong argument in favor of the infectious nature of the disease. None of the cases showed gross indiscretions in diet immediately previous to the onset, but there were usually histories of a few attacks of indigestion. If the condition was dependent on digestive disturbances it ought to be more frequent in summer; especially was this true as most of the indigestion of children occurred in the summer. In some of the cases there was no digestive disturbance apparent and no change in the digestive function. The initial vomiting was probably toxic. After a consideration of the bacteriology of the condition, the writer said that the possibilities of the examination of blood cultures and duodenal contents might give them light on the etiology. Infection occurred most likely through the digestive tract but this was not conclusive; from the fact of its seasonal incidence, infection might take place through nasopharynx. The symptoms were headache, lassitude, anorexia with vomiting, and a rise in temperature. In only three cases was there no fever at the time of the onset. In none of the cases was the pulse slow. A high fever was usually associated with a rapid pulse. There was pain in the abdomen in ten of the twenty-five cases; in three cases there was pain in the legs. In two of the cases the urine became darker on the first day and in others on the following early days of the disease. It returned to its normal color in one, two or three weeks. In three cases there were traces of albumin but no casts. The color of the urine was the most convenient method of determining the improvement of the jaundice. The stools were too disagreeable in odor for the parents to wish to bring them for analysis. The conjunctiva remained yellow long after the improvement of the jaundice had begun. Dr. Hermann said that he tested the color of the urine by having five vials one containing the normal yellow of urine and the others containing variations both paler and deeper yellows and by means of comparison with these he could measure the degree of improvement in the color of the urine of the patient. The clay-colored stools were characteristic and were observed from the second to the sixth day of the disease. In twelve of the cases the bowels were regular, in four there was diarrhea, and in eight constipation. The appetite was poor in almost all of the cases, but after the initial stage it improved. There was itching in those in whom the jaundice was most pronounced. The liver was palpable in twenty-one of the cases and normal in four. With an improvement in the condition there was a gradual return to the normal size. In three or four months the liver and spleen were no longer palpable. The spleen was palpable in ten and not palpable in fifteen of the cases, and returned more rapidly than the liver to the normal. All but one of the cases recovered. There were no points of difference between the fatal case and those that recovered except a difference in the severity of the condition. As to the treatment, in many cases it was only necessary to restrict the fat and to give soup, lean meat, vegetables, skimmed milk, and bread. Cholegogues had little or no cholegogic effect; any apparent effect of that nautre was due to increased peristalsis. In prescribing the diet one should not increase the secretion of bile, and small frequent meals were a means toward this end.

DISCUSSION.

Dr. Frederick Forscheimer of Cincinnati asked whether blood examinations had been made and whether there were any bacteria in the blood. There was no trouble about palpating especially in a child, but inflammation in the gall-bladder wall brought about changes which resulted in the ordinary tissue being replaced by connective tissue and it should never be used. Such work in the dark was liable to be followed by rupture of the gall-bladder, collapse, and death .

Dr. Charles Herrman said that he had never advocated the procedure but had only said that it was difficult to carry out.

HIRSCHSPRUNG'S DISEASE WITH OPERATION AND RECOVERY.

Dr. H. C. Machell of Toronto, Canada, said that on the 10th of June, 1912, he was asked to see a boy of three years of age. Examination showed a poorly nourished child, with a gray, sallow or muddy complexion. He stood or walked in a feeble way; the abdomen was large, tympanitic over all areas, tense, and shiny even in the flanks. Coils of intestine were plainly visible. An intestinal peristaltic wave was seen at times, often running from the right upper abdominal, to the left inguinal region. A diagnosis of congenital dilatation of the colon, or Hirschsprung's disease, was made. Feeding and outdoor life were suggested till autumn, when operation was advised. On the 6th of November an operation was performed by Dr. Arbuthnot Lane of London. The pelvic colon was divided, and anastomosis was made with the ileum. The pelvic colon and the ileum were divided, the latter at a point close to the cecum, and anastomosis established between them. The mesentery was drawn together, closing the space in the pelvis with a purse-string suture, and the fluid end of the pelvic colon was fixed to it. No mechanical obstruction, kink, adhesion, stricture, or contraction of either colon or rectum was found at the time of operation to account for the distention. The patient was returned to bed in fair condition. No diarrhea followed the operation; neither was shock, thirst or any discomfort complained of at any time. The patient made an interrupted recovery.

Operation.—A mesial incision was made through skin and linca alba extending from 2 to 3 inches above the umbilicus to 2 inches above the lymphysis pubis: the peritoneum was picked up and slit into its full extent of wound. The edges of the incision were now retracted the large bowel forced its way onto the surface of the abdomen in a greatly distended condition; the intestine was covered with warm paraffined silk handkerchiefs. The large intestine was clamped about 7 inches above the anus; the small intestine was clamped 3 inches above the cecum; stout cat-gut ligatures were inserted into the mesentery at intervals and the mesentery divided after each ligature all around. The small and large intestines were divided between the original clamps; the free end of the pelvic colon was cauterized; the large intestine was removed save a small portion of pelvic colon was sutured and a clamp was applied to the side of the colon. The free end of the ilium was brought over to the upper surface of the colon and sutured on one side, with No. oo silk. The colon was opened and sutures were continued around the gut; a suture was now inserted, taking in all the coats of the intestines and the serous coat sutured over it; a side to side anastomosis was formed.

A purse-string suture of strong gut was now passed around to the free margin of the mesentery. This closed the space in the pelvis, into which the bowel might fall.

DISCUSSION.

Dr. Edward E. Graham of Philadelphia asked how much of the colon was removed. He thought that Lane in operating for this condition in children had achieved wonderful results in that he had had only one death in sixteen operations. The results were certainly remarkable and he would like to ask if any other surgeon had attained any result approaching this. He had had such a case and it was intended to do a two-stage operation. The child, however, died after the first stage of the operation. It was important to decide in regard to the mortality of operation in these cases for if others could get the results that Lane had secured operation was justifiable.

Dr. J. Crozier Griffith of Philadelphia said that Dr. Machell was to be congratulated on the results in his case. He had had a case and had made a study of the literature on the subject and found only twenty-four cases which really came under the category of Hirschsprung's disease. The condition must be congenital and idiopathic; many of the cases had kinks, etc., and could not be classified in this category. The condition must be dependent upon an innate tendency to dilatation and not on stenosis. Cases had been reported long before Hirschsprung wrote on the subject and the condition should not bear his name. Hard fecal masses were rarely found in these cases; often the contents of the colon were liquid. The mortality in the cases that he collect. The cases as stated numbered twenty-four, and eighteen resulted fatally. Only two were known to have recovered. In another case in which the abdomen of the patient was enormously distended in infancy the condition improved and now at the age of four years the child had no symptoms and seemed perfectly healthy. It would have been a mistake to have exposed that child to the great risk of the operation. Operation could only be indicated when the condition was congenital and idiopathic.

Dr. Machell said that the small intestine was taken off about 3 inches above the appendix. No other surgeon showed such statistics as Dr. Lane. He did the operation in two hours and worked very rapidly. An interesting point was the purse-string suture looped toward the pelvis so that no kinks could occur. There was not a drop of blood and the wound healed by first intention.

THE RELATION OF THE PHYSICIAN TO SOCIAL SERVICE.

Dr. J. C. Gittings of Philadelphia.—Since the disturbances of health, in the broadest sense, were such important factors in the etiology of social ills and since hospitals, for the time at least, had extended their functions so as to embrace as many problems of health as circumstances would permit, why should not physicians as a class assume greater responsibility in directing the social work of hospitals instead of leaving it largely in the hands of layworkers and laymanagers. Was it because physicians had failed to grasp the basic value of this work and its direct relation to medicine? Or, after due consideration, were they convinced that the work was chiefly a sociological measure and therefore left to lay workers its organization, development, and direction. In order to gain some light upon these questions the writer of the paper had sent a questionaire to members of the American Pediatric Society and other physicians interested in pediatrics. He found from this inquiry the social service departments had been established in one or more hospitals in eleven out of eighteen cities from which reports had been received. Out of sixty-nine hospitals, twenty-nine maintained more or less complete social service and nine performed follow-up work with nurses; 45 per cent. apparently made no attempt as to after-care although in a number of instances this deficiency was about to be corrected. In every instance physicians approved of social work, only a few stipulating that proper management was essential. To sum up the evidence showed: 1. That physicians approved heartily of social service, and appreciated its value. 2. That hospitals were somewhat slow to take it up. 3. That physicians considered it more as a sociological adjunct to, than as an integral part of, medicine. 4. Partly on this account, partly for lack of opportunity and for unknown reasons, they often failed to assume responsibility for directing it. In examining the questions of function and direction Dr. Gittings considered those which could be performed chiefly on the basis of sociological training as sociological functions; those which a trained nurse could best perform he grouped as medical functions. Among the medical functions he classed the prevention of contagion and the discovery of cases in the home, advice and guidance in plan and place of treatment, nutrition and hygiene of the person and home nursing. Figures were given showing the number of diseases in which the functions were required, and showed a preponderance in favor of medical functions. The writer cited evidence coming from institutions in which social service operations had reached a high degree of development showing that, broadly speaking, the chief function of social service in general hospitals was medical. In the work among children the functions of social service might be defined as: 1. To instruct in home treatment of outpatients and to secure their regular attendance. 2. To prevent the occurrence and recurrence of diseases by instruction and demonstrations in the home on hygiene, dietetics, and domestic science. 3. To detect and guard against contagious diseases. 4. To detect other diseases, including mental backwardness, and to advise and direct their proper disposition and place of treatment. 5. To instruct in prenatal care. 6. To secure trustworthy social data in the home and to carry out special medical-social research. The value of these investigations was just beginning to be appreciated. This function was more medical than sociological. 7. To overcome demoralization in the home by instilling hope and courage, renewing confidence, etc. 8. Conservation of resources: finding or changing employment; providing apparatus and emergency supplies; support for patient or family; moral suasion or instruction, etc. These last two required purely social work. As to who was the best agent to have in charge of a social service department the writer believed that other qualifications being equal physicians preferred the trained nurse. Undoubtedly the personal factor was the first element; no work required greater patience, optimism, humanitarianism, tact, judgment, and above all, common sense. For this reason many social workers were laywomen, whose educational advantages were so much better than those of the average type of the trained nurse. Granted the necessary personal and educational equipment, it seemed the training of the trained nurse in a large general hospital supplemented by sociological training must furnish the best preparation for medical social work. The best interests of a social service department demanded the directing of a committee formed of representatives of the medical staff, board of managers, and, if desirable, of the ladies' committees, with the head worker. In the Annual Report of the social department of a well-organized social department of a prominent hospital were found the following: "Doctors are as well trained in social diagnosis as laymen in medical diagnosis." This was not meant as an arraignment but its truth could not be questioned. The art of medicine of yesterday was too conservative in its conception of its true functions. Preventive principles of medicine must be extended so as to include, not only the assault of contagion, but also the less spectacular but no less dangerous undermining of faulty habits and environment. Between the prevention of disease and the preservation of health there was no essential difference and surely the physician and not the sociologist should become the logical arbiter of all the problems relating to health. The evolution of the new type of sociologic physician should be by and through the activities of social work. In the medical school he would devote much more time to hygiene, psychology, and eugenics than at present. He did not believe that the hospital would ultimately prove to be the logical agent of the constructive work of medical sociology. On the community itself must devolve public relief and education, the germs of which they saw in social service. The agent of the community must be the health department whose guiding hand would be that of the medical sociologist. This health department of the future must extend its functions so as to include every activity which concerned the health of the community, backed by the authority of the law, the health officer's powers of correction and readjustment would be infinitely greater than those of unofficial philanthropy.

Dr. Fritz B. Talbot of Boston said that at the Massachusetts General Hospital they had solved the problem by having the city social serice department move into the clinic. They must have the social service work as with their help the medical results were quite different. They were trying the plan of giving two nurses six months training in social service as a part of their two years course in nursing.

Dr. F. S. Churchill of Chicago was glad to see that physicians were beginning to realize the importance of social work; they should have taken the lead in this direction before. Social work was preventive medicine on a board scale. The social service department was well organized in the Children's Memorial Hospital of Chicago and they could not get along without it. They had fewer returns from the fact that they had a follow-up system and gave instruction to the mothers and in that direction alone they were satisfied with the results. In the older children they got better results through the operation of the social service department but not so striking as with the babies. They cooperated with other agenices in the city and their department was used as a school for civics and philanthropy and was of broad educational value to the nurse.

Dr. Gittings, in closing the discussion, said that he had had his attention directed to this subject while serving on a committee that was investigating this line of work and their investigations had embraced a large part of the country. Many organizations were interested threoretically but were not sufficiently interested; the field was one that was in reality more medical than sociological.

MUCOUS CYST OF THE CECUM IN A CHILD OF TEN WEEKS, PRODUCING OCCLUSION OF THE ILEOCECAL VALVE. AND SIMULATING A CASE OF INTUSSUSCEPTION. REACTION OF THE GUT. DEATH ON THE TWELFTH DAY.

Dr. A. D. Blackader of Montreal reported this case. The patient was an infant, ten weeks of age, seen for the first time on March 9, 1913. The child had been well for the first two months and had suffered since from persistent vomiting. A change had been made from the mother's milk to artificial food. There was no pyrexia. Dr. Gordon recognized a sausage-shaped tumor, three inches in length by one in diameter, freely movable in the lower right quadrant of the abdomen, and advised immediate operation. Distinct pesristaltic waves were noticed, travelling toward the site of the tumor. The temperature of the patient was 99° F., pulse 140, and respirations 40. At operation the tumor was found to involve the lower portion of the ileum and cecum. Above the mass the ileum was much distended, while below the ascending colon it was collapsed. Regarding it as an ileocecal intussusception, careful efforts at reduction were made but failed. A resection was therefore performed with end to end anastomosis and the abdomen was closed. The child had no symptoms of shock after the operation and for several days the condition was good. On the tenth day the pulse became weak, the face assumed an earthy hue and the features became drawn. Death from peritonitis occurred on the twelfth day. The pathologist's report showed that the tumor consisted of the cecum with its contained cyst and the appendix. The cyst when collapsed measured 2 cm. in diameter, was unilocular, contained glairy mucoid material, and was situated on the wall of the cecum opposite the ileocecal valve, extending to and obstructing that orifice. The cyst was regarded as a retention cyst, arising either from faulty development or from inflammation and occlusion of the mouth of the original gland. Dr. Blackader had found in the literature no case just like this one. There were two cases that were somewhat similar to the one reported and several that had an associated interest as the clinical symptoms were similar although the pathological findings were of a different origin.

A CASE OF BILATERAL HYDROURETER-CHRONIC PYOCYANEUS INFECTION.

Dr. Henry Heiman reported the case of a male child five years of age, who, four months before his admission to Mount Sinai Hospital became suddenly ill with fever, headache, and vomiting; a few days later blood appeared in the urine and stools. There was pain and tenderness in the right lumbar region. The family history of the patient was negative. Physical examination revealed nothing abnormal with the exception of slight dulness in the left interscapular region and a few fine râles in the left axilla. On July 27, one week after his admission to the hospital, the urine contained many pus cells but no red blood cells and there was no blood in the stools. On July 29, the urine showed the presence of the bacillus pyocyaneus. A blood culture taken seven days later was negative. On August 8, the bladder was catheterized and irrigated. The catheter was allowed to remain in place so as to observe whether the immediately succeeding urine was turbid. This was the case. On August 13 an injection of pyocyaneus vaccine was administered. The blood count was taken one hour before the injection and one hour afterward, and showed an increase in leucocytes and small lymphocytes and a slight increase in polymorphonuclears and eosinophiles. A cystoscopy was done on August 16. It was found that the right ureter was slit shaped. The left ureter had rigid walls and was circular. Purulent urine was seen to come from the left ureter. Indigo carmine injection was negative on both sides for forty-five minutes. The bladder mucosa was normal and therefore the pyuria must have been of supravesical origin.

In catheterization of the ureters, obstruction was met 1 inch from the bladder on the right side; on the left side the catheter passed 2 1/2 inches. Specimens of urine were obtained from each side. The urine from the right ureter was clear; that from the left showed

0.2 per cent. urea and many pus cells. There were no tubercle bacilli. The treatment consisted chiefly of autogenous vaccines which were administered at periods of a week or ten days. Five injections were given, the first two doses of fifty million bacteria each, after which the dose was increased by fifty million on two occasions and then by twenty-five million. The child was discharged apparently well on September 18. The patient had been admitted to the hospital with the history that the urine had been cloudy for the past six months, but without hematuria. He had no pain on micturition, three or four watery movements each day, which at times contained mucus. There was nothing abnormal in his physical examination. Examination of the bladder made on October 1 showed a moderate degree of diffuse cystitis. Both ureteral orifices were patulous. The left orifice was enormously dilated. From these appearances the presumptive diagnosis of hydroureter was made and possibly of dilatation of the pelvis of both kidneys. Argyrol was instilled into the bladder and an *x*-ray picture taken. Only an outline of the bladder together with the dilated lower end of both ureters could be recognized in the plate. A more successful radiograph showed the peculiarly tortuous course of the left ureter, and the peculiar shape of the left renal pelvis. No obstruction was found either by the cystoscope or a silk catheter. The etiology of ureteral dilatation was not easy to determine in this case. There were two groups of hydroureter, congenital and acquired. After considering the distinguishing points in each of these varieties the writer stated that he believed that in this case they were dealing with a case of anomalous dilatation of the ureters and pelves of the kidneys of anomalous origin; or second, with an acquired type of hydroureter due either to a paralytic condition of the bladder or to an obstruction of the urethra that interfered with the outflow preventing the entrance of a catheter. The unusual findings and the mode by which the diagnosis was made were of sufficient interest to warrant putting the case on record. Although temporary improvement was obtained by the use of pyocyaneus vaccines, results of permanent value could not be obtained by this mode of treatment.

DISCUSSION.

Dr. Maynard Ladd of Boston asked what position the child assumed when the argyrol was injected into the bladder.

Dr. Henry Heiman of New York said that the child was in Trendelenberg's position. These cases should not be spoken of merely as pyelitis but one should indicate the nature and causation of the infection. There were many pyogenic organisms found in these cases and one should indicate which one was responsible in producing the condition.

Dr. Henry D. Chapin said that nephritis presented a number of problems as regarded the etiology. In the cases that he had seen resulting from digestive disturbances the name of the condition was a matter of choice between the terms edema, angioneurotic edema, or purpura.

Dr. L. E. Le Frtra had seen a number of cases of this condition following digestive disturbances in which the children had been on a very thin diet, such as barley water, and he believed that the lack of proteid was a factor in producing the condition. As soon as these babies were put on skimmed milk they improved rapidly. Since eiweiss milk had come into use he had seen fewer of these cases of edema; as they all knew eiweiss milk had a high proteid content.

CASES OF EDEMA IN INFANTS.

Dr. Henry Dwight Chapin of New York said that it had been long known that local and general edemas seen in early life were not all due to nephritis, but the causes of this condition had been variously explained. Some years ago the writer had reported examinations of the urine in eighty-six cases and small amounts of albumin were found in seventy-five of them. In a series of fifty-seven cases of pulmonary diseases, traces of albumin were noted in forty-nine. Other observers had called attention to the same condition. This could not predicate the presence of actual renal disease but rather an irritation of the renal tubules accompanying a slight congestion and having no special significance. He wished to emphasize the point that edema in infants was not to be considered as due to nephritis simply because of small amounts of albumin in the urine. They must try to differentiate a little more closely this class of cases. Of the twenty-one cases reported, blood examinations were made in twelve cases; six showed mild secondary anemia with differential counts right; three showed normal or high red blood-cell count. There was no evidence in any case examined of pernicious or profound anemia, except possibly in a case with 1,900,000 red blood corpuscles, hemoglobin 85 per cent.; white polymorphonuclears 48 per cent., and lymphocytes 52 per cent. The stools were abnormal in twelve cases, fair in seven and unaccounted for in two cases.

The urine was examined in nineteen cases. There was sugar in no instance, albumin absent in nine cases, and a heavy trace was occasionally present in one case. There were occassional hyaline and granular casts in five cases; two showed occasional hyaline casts. The other thirteen showed no casts.

One showed pus and one had the phenosulphonephthalein test which showed 55 per cent. retention with some loss through leakage. The duration of the disease was from three to twenty-one days. There were seven deaths in the series; three from malnutrition; two from bronchopneumonia; one from cerebrospinal meningitis and one from pericarditis with effusion. From a study of these twenty-one cases it seemed that neither the condition of the blood nor the urine could satisfactorily explain the edema. Dr. Chapin said that he believed that they could make a rough classification of the kind of cases that might show edema. First, those cases of difficult digestion, malassimilation, and diarrheas might produce toxins that might induce a vasomotor paralysis. Dr. William E. Hume had reported thirteen cases in which general edema followed gastroenteritis in infants and young children. It had been suggested that the condition might be due to retention of salts in the tissues, particularly sodium chloride and the phosphates, but Hume in observations on two normal cases and two of edema failed to discover any difference between the salt exchange in cases suffering from this variety of edema and that which took place in perfectly normal children. These edemas with intestinal disturbances were probably analogous to the urticarias. Secondly, edema was seen in various exhaustive conditions, such as prematurity, marasmus, extreme secondary anemias, edema neonatorum and in prolonged debilitating diseases. Thirdly, in constitutional diseases such as syphilis, tuberculosis, erysipelas, and pertussis. Fourthly, in angioneuroses of vasomotor origin. Two of the cases reported were of this nature.

Dr. Nicoll had two cases which were typical of some sort of infection and were not idiopathic edema.

Dr. A. D. Blackader of Montreal he had seen a few cases in which edema was a late symptom in gastroenteric disease due to the deficiency of proteid feeding. An increase in proteid was beneficial. There was a definite mortality in these cases; this edema was a dangerous symptom. Seven or eight cases that he had seen had proved fatal.

Dr. H. M. McClanahan of Omaha cited the case of a child seven months of age that had had eczema at the age of six months. The child had been on rice water and the hemoglobin was 60 per cent. The edema was due to secondary anemia; on a heavier diet the condition cleared up and the urine showed no albumin. The edema was due in this instance to faulty feeding.

Dr. Fritz B. Talbot of Boston said that the answer as to the etiology of edemas of this nature would not be forthcoming for many years as salt metabolism was not understood, and was so mixed with the metabolism of other food elements that it was difficult to say which constituent of the food was producing the effect. He knew one child that was getting 0.7 per cent. salt that would have died of acute edema of the lungs had not a physician been present who drained the lungs by inverting the baby.

Dr. H. T. Machell of Toronto said that of six babies with edema all recovered but one and that one was the only one that showed any change in the urine. They were practically all feeding cases.

Dr. Chapin said in regard to the question as to whether the condition was due to obscure nephritis or to the blood, he thought that there was eveidnce that the blood and kidneys had nothing to do with it. He believed that it was due to an exhausted condition, but to something else as well. It should be considered as a serious condition which served as a warning of a fatal outcome and was a terminal condition. In a large number of cases it was due to starvation but in other cases it was a terminal condition due to some sort of exhaustion and before they could understand it they must know more of salt metabolism. They should watch carefully for such symptoms and if they appeared feed up the baby.

(*To be continued.*)

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Diabetes in Infancy and Childhood.—J. L. Morse (*Bost. Med. and Surg. Jour.*, 1913, clxviii, 530) has seen nineteen cases of diabetes in children, eleven boys and eight girls. Polyuria was the first symptom noted in five of seventeen patients over two years of age. Enuresis was the first symptom noted in four, excessive thirst in three, emaciation in three, quietness in one and disturbance of vision in another. Polyuria was noticed in all. Polydipsia was, however, noted in but thirteen, emaciation in thirteen. Only nine were constipated. A large appetite was noted in six; loss of appetite, in three. Enuresis was present in five and irritation and itching of the external genitals in four. Itching of the skin was mentioned in but one case. Three were nervous, two were quiet, one suffered from headaches and one had trouble with vision. The onset is usually described as acute in childhood. It is, however, probably less often so than is ordinarily supposed, because what is taken for the onset is undoubtedly not infrequently the change from the mild to the severe type of the disease. The younger the child, the shorter the course as a rule. The prognosis in childhood is almost uniformly bad. Diabetes should be recognized at once in those cases in which the symptoms are typical. It should also be thought of in all cases in which there is gradual failure or a condition of malnutrition which is not otherwise accounted for. Irritation of the external genitals, especially in girls, and the appearance of enuresis in children previously continent should always suggest it. The finding of sugar in the urine under such circumstances confirms the diagnosis. The finding of sugar in the urine without other symptoms of diabetes does not, however, justify the diagnosis of this disease, because a temporary glycosuria as the result of overstepping the limit of tolerance is not uncommon in childhood. Temporary glycosuria is not uncommon in the acute digestive disturbances of infancy, in which conditions the assimilation limit is not infrequently lowered. If the sugar in the food is lactose, the sugar in the urine is in the form of lactose or galactose. The treatment of diabetes in childhood is the same as in later life, and consists essentially in the regulation of the diet. The general principles are to cut the carbohydrates down as low as is possible without bringing on an acid intoxication and to make up the calories lost in this way by increasing the amount of fat and proteids in the diet. This is no more difficult in children over four or five years old than in adults. In younger children, whose diet is made up to so great an extent of milk and starches, it is difficult to give enough fat and proteids to cover the caloric needs, and in infants, not old enough to eat meat and eggs, almost impossible. The diet in infancy has to be made up of cream, sugar-free milk, white of egg and beef juice. The milk can sometimes be enriched by the addition of precipitated casein. If it is necessary to give more starch, soya bean flour is a very good form to use, in that it contains a larger proportion of proteids than other flours. Eggs, fish, meat and butter may be added to the diet of children just past infancy. The diet of older children is planned in the same way as that of adults. It is better, as in adults, to give the starch in the form of the common articles of food, such as bread and potato, than in that of any of the gluten preparations, almost all of which are unreliable. It is wiser to give starch and have a little sugar but no acetone bodies in the urine than to withhold starch and have acetone bodies and no sugar in the urine.

Excretion of Formaldehyde in the Urine of Children Taking Hexamethylenamin.—F. B. Talbot and W. R. Sisson (*Bost. Med. and Surg. Jour.*, 1913, clxviii, 485) have examined the urine of forty-four children and babies taking this drug. All showed formaldehyde in the urine at some time while under observation. Relatively large doses are often necessary before the excretion of formaldehyde takes place. As pointed out by Jordan, "the more acid the urine the greater is the decomposition of urotropin and excretion of formaldehyde." Since it has been shown by other observers that the antiseptic power of urotropin is dependent, not upon the hexamethylenamin, but upon the presence of free formaldehyde, urotropin should not be given with drugs that cause the urine to turn alkaline. To insure the efficacy of the drug, specimens of urine after the administration of hexamethylenamin should always be examined for the presence of free formaldehyde.

Relation of Appendicitis to Scarlet Fever and Related Diseases.—Oswald Meyer (*Berl. klin. Woch.*, March 17, 1913) finds that appendicitis is frequently observed as a complication of various infectious diseases. It is seen in angina, scarlatina, pneumonia, rheumatic polyarthritis, etc. The appendicitis may occur in one of three ways: 1. as a metastasis of the infectious process; 2. as the primary disease causing the other manifestations; 3. as a manifestation of the same infection as the accompanying disease. The author gives the history of a case in which the last method appears to have been the true one.

Diagnosis and Treatment of Intussusception.—W. E. Ladd (*Bost. Med. and Surg. Jour.*, 1913, clxviii, 542) says that the mother's story of a baby who has been well and suddenly taken with an attack of abdominal pain associated with drawing up of the legs and followed by vomiting, is sufficient reason for making a thorough abdominal examination even if the baby looks well. At this period before any distention has taken place, a small mass or sense of resistance may be felt at any place along the course of the colon, but in this early stage is most likely to be felt at the cecum or between there and the middle of the transverse colon. The next sign which presents itself is the appearance of blood in the stools. The presence of blood without much feces, and without mucus and the frequent movements characteristic of infectious diarrhea, is practically pathognomonic of intussusception. There must, of course, arise a certain number of cases in which the early diagnosis is difficult. For such cases the *x*-ray with bismuth injections may be very useful. A plate published by the writer shows very clearly how useful this procedure might be in a case where the diagnosis was difficult.

The Oscillometer of Pachon in Apparent Death in the New-born.—P. Balard (*la Presse méd.*, March 29, 1913) proposes a new method of ascertaining whether life is present in the apparently dead child just after birth. It is very difficult to tell by either the use of the senses or auscultation. If the oscillometer of Pachon be attached to the body of the child it is so delicate that the slightest movement of respiration or pulse will be at once recorded, and thus we shall get a reliable indication of whether we should attempt to resuscitate the apparently dead child.

Effect of Hygienic Surroundings on the Morbidity and Mortality in Pneumonia Following Measles.—Ludwig Maier (*Münch. med. Woch.*, March 25, 1913) gives an example drawn from the records of the Universitäts-Klinic of Munich to show how much difference occurs in the morbidity and mortality of pneumonia of measles when radical changes are made in the hygienic surroundings of a hospital. The contagious wards of the hospital were torn down and rebuilt during the service of the author. In the old, dark, ill-ventilated and crowded buildings the mortality was about twice as great as in the new well-ventilated, light pavilions erected. Before the change the percentage of complications in measles in the nature of pneumonia, lobar or bronchial, was 36.9; afterward it was 20.7. The attending physicians and the methods of treatment were the same in the two periods. Among the children having measles in the earlier period there were more who had rickets or other intercurrent diseases or who were merely weak, than in the later period. The sanitary conditions of the new pavilions were much better than in the old buildings, where the toilets were in close proximity to the beds. It seems clear that the improvement in the results was due to the improvements in hygiene and sanitation that were made in the institution.

Diphtheria Septicemia.—The autopsy records of the Babies' Hospital since 1907 contain four instances of diphtheria bacteriemia discovered postmortem. The clinical history of two of these is cited by E. Morgan (*Amer. Jour. Dis. Child.*, 1913, v, 317). An analysis of six cases in the literature reveals several interesting facts. The organism isolated from three of the patients proved non-pathogenic for guinea-pigs. The other three were not tested by animal inoculation. Diphtheria antitoxin was administered in three instances, apparently without beneficial results. Endocarditis was twice observed as a complication. The case which prompted this report is unique in that it is the first recorded example of diphtheria bacteriemia in an infant. Female, aged seven months, was admitted to The Babies' Hospital Feb. 29, 1912, with history of vomiting and progressive loss in weight. The vomiting improved after correction of the feeding but the weight chart continued to show a steady decline. On March 13 a profuse nasal discharge occurred, cultures from which showed the *B. diphtheriæ.* The condition improved after administration of antitoxin. On April 14 the temperature rose to 102° F. and for four days remained irregularly high. On the eighteenth a bloody nasal discharge again developed which showed almost a pure culture of *B. diphtheriæ.* The same morning blood was taken for culture from the external jugular vein. Death occurred on the night of the nineteenth—thirty-six hours later. There was an antemortem rise of temperature to 106° F. An autopsy was not permitted. The blood culture showed the bacillus of diphtheria, which proved, however, non-pathogenic for the guinea-pig.

Round Ulcer of the Duodenum in the First Year of Life.—W. Schmidt (*Berl. klin. Woch.*, March 31, 1913) finds records of few cases of round ulcer of the duodenum in children under one year of age. He bases on his results at autopsy the statement that this lesion occurs more frequently than is generally supposed. Helmholz believes this lesion to be due to functional insufficiency of the intestinal wall caused by decomposition and changes in the circulation of the bowel. Autopsies were performed upon 1109 children and among these 1.8 per cent. or twenty cases showed round ulcer. The usual site of the ulcer was high up in the duodenum just below the pylorus, on the posterior wall of the intestine. The walls of the ulcer were not swollen or inflamed and were colored by bile. The condition of nourishment of these children was very bad, there being marked septic symptoms in many and great emaciation. The diagnosis may be made if there is bleeding by mouth or from the rectum, but in fourteen of the cases examined there were absolutely no symptoms present during life that would indicate ulcer. The death of these children would show that the prognosis in cases of ulceration is uniformly bad. Such children would not be submitted to operation on account of their youth and poor general condition. Ulcer may accompany almost any serious disease which reduces the general condition of the child.

Leukocytosis in Osteomyelitis and Tuberculosis of the Bones in Childhood.—Basing his conclusions upon blood counts in thirty-five of the former and fifty-three of the latter group of cases, E. W. Fiske (*Bost. Med. and Surg. Jour.*, 1913, clxviii, 606) says that routine examination of children with tuberculosis of the bones and osteomyelitis, two-thirds of the cases in both diseases being in an acute stage, shows an average white count of 11,600 for the former and 16,200 for the latter, a significant difference of about 5,000 leukocytes. That this difference is constant, and is a reliable factor in diagnosis, is shown by the fact that in osteomyelitis but 24 per cent. of the counts were below 12,000, as compared with 66 per cent. in tuberculosis, while 39 per cent. of the former were over 18,000 and but 13 per cent. of the latter over 15,000. This difference is still more emphasized in the acute cases, the average for osteomyelitis being 22,200 and for tuberculosis 11,400. Leukocytosis does not occur in bone infection by the tubercle bacillus, but only in the presence of a pyogenic organism. The only cases offering difficulty in diagnosis from the white count alone are those cases of osteomyelitis with a normal count or very low leukocytosis, which are commoner than most text-books affirm. In these, the relation of the count to other symptoms, such as the fluctuation of the count with the temperature or with the general condition (a relation which does not exist in bone tuberculosis), the presence of a freely draining bone abscess, especially if the count is low following operation, or the existence of a long-standing, low-grade process in a case in which the count has been at one time high, should point to a diagnosis of osteomyelitis.

The Celiac Affection.—A patient of H. C. Drury (*Dubl. Jour. Med. Sci.*, Apr. 1, 1913), a girl three and a half years of age, had had for many weeks attacks of diarrhea which resisted treatment and had gradually become almost constant. Emaciation, weakness and listlessness were noted. There was no fever. She slept and ate well and had no vomiting. The limbs were flabby. The abdomen was greatly distended, apparently because of flatulence. The bowels moved three or four times in twenty-four hours. Each motion was very copious—larger than one would expect for such a child as its single evacuation for the whole twenty-four hours. The motion was in appearance and consistence just like porridge, but whiter and usually slightly frothy. When passed a great deal of flatus was released with it. There was no obvious mucus to be seen in the stool unless an aperient had been given. The odor was extremely disgusting. The stool contained no excess of fat. Week after week the child continued in much the same state, no better, no worse; just maintained her weight or lost a few ounces; lay quiet, apathetic, and uncomplaining, slept well and ate all she could get. Gee has described this condition under the heading "The Celiac Affection." Fever is usually absent. A fatal termination is common. Nothing is known of the pathology. The treatment, in a word, is —stop all milk and carbohydrate food, and feed entirely on raw meat and meat extracts. Within two or three days of the adoption of this line of treatment the stools began to assume the ordinary color; they were smaller in quantity and number, but were even more offensive than before. This, however, gradually subsided. The abdomen, too, became less and less distended, and finally quite normal in appearance. The child's general condition remained just the same—dull, apathetic, silent, taking no interest in anything, and not gaining in weight. After some weeks carbohydrates were added very gradually to the diet. Under this she began to put up weight, to show more life, beginning to talk, sing, play with toys and other children, and so went on till she became quite normal in these respects. A little milk was tried, but at once she got diarrhea with mucus in stools, and it was stopped. The chief difficulty seems to be to get the patient gradually onto ordinary diet and to know when to begin to do so. It appears that milk has a more prejudicial effect than other foods.

Acute Colitis of Infants.—V. Hutinel and P. Nobecourt (*Arch. de méd. des enf.*, March and April, 1913) say that acute colitis is quite frequent after the age of six months. It generally results not from the action of any one germ, but from a combination of several germs accompanied by improper alimentation. It is most frequent in artificially fed children, who are generally constipated, and whose intestinal contents give a good culture medium for all sorts of germs in the retained and decomposed feces in the lower bowel. Sometimes the germs are introduced from without, sometimes they have existed for a long time in the intestine, but their virulence is increased from some cause. In many cases there is increase in adenoid tissues in the nasopharynx accompanying the condition. Feeding, heredity, functional disturbances of the liver all predispose to colitis. Once established there come on a series of morbid phenomena indicating general infection, and intoxication caused by the abnormal products of the intestine. Such symptoms are accompanied by lesions of the mucosa, defective assimilation, and even anaphylactic symptoms. The complexity of the symptoms and the number of different forms are a proofof the multipilicity of the causative factors. A clear diagnosis of the conditions present is the only thing that will assist in a proper treatment of the child. Simple formulas should be disregarded, and each case treated by itself. Since in many case the disease results from too much milk and milk used too long, it is necessary to stop milk and to make use of cereal and vegetable broths. It also follows the too early use of meat and eggs, which must be stopped. First of all the contents of the stomach and intestine must be evacuated by lavage of stomach and bowels, and mild cathartics should be given so as to prevent the intestinal contents from remaining a good culture medium for the germs. Then appropriate symptomatic medication must be undertaken.

Congenital Goiter.—A. Remy and C. Tairise (*Ann. de méd. et chir. inf.*, April 1, 1913) relate a case of congenital goiter so large that death occurred in an attack of suffocation. The mother had a parenchymatous goiter, and belonged to a goiterous family, while the family of the father was normal. The infant was born cyanosed and the marked enlargement of the front of the neck was at once noted. It suffered from crises of dyspnea and died in one of these paroxysms. Autopsy showed a very large thyroid surrounding the trachea and esophagus and compressing the trachea so that it had become flattened. The size of the thymus was normal. The labor had been so rapid that it could not have caused so marked a thyroid congestion. Venous stasis could not have brought about such compression. The hereditary element seems to be demonstrated in this case.

Protein Metabolism in Infants fed on Protein Milk.—B. R. Hoobler (*Amer. Jour. Dis. Child.*, 1913, v, 308) says that the clinical advantages of protein milk as a corrective for diarrheal conditions in infants are confirmed by the following metabolic findings: The protein intake is not increased sufficiently to be a detriment to the child, but on the other hand, frequently supplies only a sufficient amount to make up for the previous protein depletion. When kept on this high protein intake for but a short period, the specific dynamic action of protein may be disregarded. Even though the food be low in caloric value, and while there may be loss of weight, there is nevertheless sufficient protein retained to prevent waste of muscle tissue and provide for growth. The changes in the stools accompanying protein milk feeding are due to: a decrease in the total acidity in the stool, in the volatile acids, in the fatty acids, and in the amount of water lost through feces; an increase in the formation of soaps, and a better retention of the mineral salts. All of the above factors tend to produce fewer stools through lessened irritability and formed stools through the reduction of water and the formation of soaps. These chemical results may all occur within the space of three or four days, and confirm the clinical observation that in many cases protein milk may be discontinued at the end of a very short period, thus using it as a corrective for diarrheal conditions only and not a as true food.

Infantile Scurvy in Child fed on Pasteurized Cow's Milk.—C. A. Pfender (*Med. Rec.*, April 19, 1913) states that whenever boiled or sterilized milk is used for any length of time scurvy is almost certain to manifest itself. It has even been known to occur in children fed exclusively on breast milk. The literature shows twelve such cases in 379 of infantile scurvy. The disease has rarely been reported in infants fed on pasteurized milk. The writer records the case of an infant which did well on modified milk but on pasteurized milk developed slight anemia manifested by a moderate pallor of the skin of the face and conjunctivæ, pain and a form of pseudoparalysis, but no enlargement of the bones, slight hemorrhagic swelling and softening of the gums. Erythrocytes were present in the urine. Fever was absent throughout. Rapid recovery followed the use of antiscorbutic diet.

Prophylactic Vaccination against Epidemic Meningitis.—With A. Sophian, J. H. Black (*Jour. A. M. A.*, 1913, lx, 1289) vaccinated against epidemic cerebrospinal meningitis, during April, 1912, ten healthy students. Three doses were given at seven-day intervals. To half of them doses of 500 million, 1,000 million and 1,000 million were given. The other five received doses twice as large. Examination of their blood showed an early development of agglutinins and immune bodies which increased after the second and third injections and reached a high degree. Eleven months later the writer repeated the former experiments to determine what, if any, evidences of immunity could be demonstrated after this time. Eight of the ten students were accessible. In addition to the blood of a normal individual acting as a negative control, the blood of a student who had recovered from a severe case of meningitis just prior to the time of these vaccinations was used as a positive control. The following conclusions are drawn from these studies: Prophylactic vaccination produces a high degree of immunity in most cases, this immunity being demonstrable at the end of one year. It seems a justifiable conclusion that most individuals prophylactic-ally vaccinated may safely consider themselves immune for at least one year. Exceptions to this will, of course, be found. Some individuals may show an actual increase in immune bodies at the end of one year over those demonstrable soon after vaccination. Fixation occurred with the serum of the positive control who has recovered from meningitis but this fixation did not reach as high dilutions as did that of some of those vaccinated. This has previously been found also in some others recovered from the disease. Experimental evidence warrants us in concluding that prophylactic vaccination is a measure of the greatest value in the control of epidemic meningitis.

Treatment of Pulmonary Tuberculosis in the Child by the Method of Ferrier.—Galliot (*Arch. de méd des enf.*, April, 1913) gives his results in children unable to leave the poorer quarters of Paris for the country, when treated by the remineralization of Ferrier. The children treated were in the first and second stages of pulmonary tuberculosis, or had tracheobronchial adenopathies. The remineralization is accomplished by the administration of a mixture of carbonate and phosphate of lime, chloride of calcium, calcined magnesia, and arrhenal, given in powders proportionate to their age, three times daily for months. He also gave cod-liver oil because in its composition it has lecithin, and organic phosphorus, iodine, and bromine assisting in remineralization. The little patients treated by this method all were benefited by it. Two typical histories are given in detail. He finds that the pulmonary lesion was benefited by the treatment; although cicatrization has not yet been obtained and there must be some reserve as to the ultimate results, still there has been a complete arrest of the development of the disease. The general condition has much improved, the loss of flesh and cachexia have ceased; weight has increased and growth has gone on regularly. The author recommends this method of treatment which is applicable among the poor who cannot go to the country or undertake expensive treatment.

Constitutional Psychomotor Asthenia in Children.—G. Paul-Boncour (*Prog. méd.*, April 12, 1913) describes a condition which he believes should be differentiated from ordinary neurasthenia, although it is often diagnosed as such. In this the child has motor debility, asthenia, and inability to use his mental faculties, while in the neurasthenic state there are mental irritability, melancholy, and horror of effort. In the asthenic conditions there is no melancholy at all. The muscular inability is marked; the mental inertia is complete; the asthenic is incapable of overwork, while the neurasthenic may tire himself out. This condition is constitutional and begins in early life. True neurasthenia is never seen before the age of puberty, while asthenia may be observed much earlier. In a case described by the author a marked development, mental and physical, resulted from the administration of pluriglandular extracts.

Diphtheritic Hemiplegia.—J. D. Rolleston (*Clin. Jour.*, April 9, 1913) refers to hemiplegia as a rare occurrence in diphtheria. Out of 9,075 completed cases admitted to the Grove Fever Hospital between

August, 1899, and September, 1912, only six developed this complication. In all the initial attack was severe and was treated by large doses of antitoxin. All had abundant and persistent albuminuria. With the exception of one case, in which the hemiplegia was probably due to uremia, all developed a well-marked cardiac lesion suggestive of an embolic origin for the hemiplegia, but in only one was it possible to verify this postmortem. Analysis of eighty cases found in the literature shows that the hemiplegia took place: In the first week in one case, in the second week in fourteen, in the third in twenty-seven, and in the fourth to the seventh in twelve. In fourteen cases, where no exact date is given, it is said to have developed in convalescence; in twelve no date is given. Recovery took place in fifty-two, death in twenty-four, in four no details were given. Necropsies were held in eighteen cases. Embolism was found in thirteen, thrombosis in three, hemorrhage in one, and sclerotic atrophy in one. In all the cases where details are given the initial attack was severe. Albuminuria and ordinary diphtheritic paralyses were present in a large number. Diphtheritic hemiplegia is usually due to embolism. Embolism is probably commoner in diphtheria than in any other acute contagious disease, being due to endocarditis. The prognosis in diphtheritic hemiplegia as in hemiplegia generally following acute infections is unfavorable as regards complete recovery. There are only four cases on record in which complete restoration of function has occurred. In the great majority of cases contractures and atrophy have supervened in the paralyzed limbs. Hemichorea and imbecility are other sequelæ occasionally met with.

Acute Endocarditis in Childhood.—P. Nobécourt (*Jour. de méd. de Paris*, No. 13, 1913) considers acute cardiopathies in children in distinction from the congenital lesions, in which life is generally short. In acute cardiopathies there is a possibility of survival and fair conditions in adult life. Acute endocarditis is common in children. It would seem that in the child there is a predisposition to endocarditis which continues into adolescence. It is rare under three years of age. This disease is always of infectious origin, and may be caused by a variety of germs; all varieties are found, from the simple to the malignant types of endocarditis. The signs of infection may be so slight as not to be recognized, and yet the heart involvement be quite pronounced, leaving valvular lesions. Very often a condition of lymphatic enlargement of tonsils and adenoids is found in these children. Acute articular rheumatism is frequent, complicated with generalized fever and general symptoms. Again the lesion is accompanied by no fever, and almost no pain. Rheumatism is the most frequent cause of endocarditis; chorea is also accompanied by heart lesions; scarlatina and all the other infectious diseases of childhood and adult life may cause lesions of the valves due to an accompanying endocarditis. Family predisposition and overwork are occasional factors in endocarditis. There may be simple proliferative lesions of the valves, the mitral being the one most frequently affected. The symptoms of palpitation, dyspnea, pain, and rapid pulse are not frequent, and when they are present the development of a pericarditis, or myocarditis, is to be suspected. Percussion may give change in the size of the heart, but the most information is gained by auscultation. A low, dull murmur quite different from the harsh hissing murmur of chronic endocarditis may be heard. Mitral murmurs are heard at the apex, not transmitted to the left. In children under five years of age modifications of the sounds are hard to detect, and only later is the murmur heard. The valvular murmurs may clear up or remain permanent. We must be on the lookout for relapses and not declare the case cured too early. The simplicity of the symptoms should not lead us to call this affection benign; its remote prognosis is grave, for it may end in chronic valvular lesions.

Head Injuries of the New-born.—D. G. Wilcox (*Bost. Med. and Surg. Jour.*, 1913, clxviii, 568) says it is conservatively estimated that in cases of forceps delivery, from 30 to 40 per cent. of the infants so delivered suffer more or less from intracranial hemorrhage. The majority of cases show the hemorrhagic centers to be in the parietal or frontal regions, close to the longitudinal sinus. The second most frequent center was just above or below the tentorium, or in the tentorium itself. While tentorium lacerations are the most fatal, they are by no means the most unfortunate, for many of the frontal and parietal lacerations produce clots, which by their continued pressure, tend to destroy the cells of the cortex, producing a porencephalia with all its attending mental defects. If the new-born child appears to be dead, and does not respond to the usual methods, such as clearing the respiratory passages, immersing in warm water, friction, etc., intracranial hemorrhage should be suspected. If the child breathes but gives signs of low vitality, the following symptoms would be suggestive of cranial pressure: Undue protrusion of the fontanelles, pallor of the skin, deviation of the tongue, head drawn backward, convulsions, impeded respiration, such as Cheyne-Stokes, or respiratory irregularity in any form. If the child survives the first few weeks of life, and the clot continues to cause irritation, the symptoms are: Difficulty or inability to swallow, inequality of the pupils, frequently recurring convulsions, spasmodic screams, continued restlessness or drowsiness amounting almost to coma, muscular insufficiency, especially an inability to support the head. Still later come the evidences of paralysis if the clot be in or near the motor area, and later, imbecility in some cases. We cannot state how late an operation can be performed with hope of success, it is entirely safe and reasonable to operate upon the new-born a few hours or days after birth, with very excellent chances of recovery.

Operative Treatment of Otitic Meningitis.—E. W. Day (*Surg. Gyn. and Obst.*, 1913, xvi, 369) has treated fifty-seven cases of meningitis since 1897; fifty-three were of otitic origin, two of nasal, and two secondary to pneumonia. All were diagnosed as diffuse suppurative meningitis and this was confirmed in thirty-eight cases by autopsy. Four cases recovered, three through operative means and one with the aid of vaccine therapy. One of the three cases, however, died three months later from a reinfecting meningitis.

Meningitis followed chronic purulent otitis and its acute exacerbation twice as frequently as the acute purulent otitis. Seven cases were complicated by sinus thrombosis, eight by brain abscess, and ten by purulent labyrinthitis. The mastoid operation, either simple or radical, was performed in forty-eight cases. In fifteen no other surgical means were employed; in thirty-three cases the mastoid operation was supplemented by other procedure directed to the infected meninges—in ten cases by dural drains; in eight by simple incision of the dura for drainage; in four by autogenous vaccines; in three by drainage of the cisterna magna; in one by drainage of the lateral ventricle; in one by lavage of the ventricie; in four by intraspinal injection of urotropin solution; in two by intraspinal injection of oxicyanide of mercury. Operation must be done early, practically before the meningitis has developed. This means that the operation, to accomplish its purpose, is not one for the cure of a diffuse meningitis, but one to prevent suspected localized meningitis from becoming diffuse. Of the early symptoms of meningitis, the two mentioned by Haynes, steady increase in blood pressure and edema of the papilla, are a distinct diagostic help; but lumbar puncture at the present time gives the most reliable information as to the condition of the meninges. Slight turbidity cannot be accepted as a positive sign of a diffuse process, for it may result from a very limited area of infection. In serous meningitis, a slight turbidity may be present with no pathogenic organisms. Decided turbidity with a markedly increased number of polynuclear leukocytes in the presence of pyogenic organisms indicates an extensive involvement and a correspondingly hopeless condition. The bacteriology of the primary aural infection offers no indication for or against operative interference. It does not always follow that the organism found in the ear at time of examination will be identical with that in the dura. This is especially true in chronic purulent otitis media. Nor does the nature of the dural infection offer any indication for or against operative measures. The individuality of the organism seems to make but little difference in the course of the disease, either before or after the operation. Of more importance in influencing the course of the disease is the virulence of the infecting organism. This is apt to be of a mild grade in those cases where the spinal fluid is either free from bacteria or contains only attenuated forms. The clinical condition of the patient, even if grave, offers no contraindication to operative procedure. The treatment of suppurative meningitis by the administration of drugs per gram has been proven absolutely valueless, except possibly in the use of urotropin as a prophylactic. Serum and vaccine therapy have been a disappointment. The one recovery mentioned can be considered only as an exceptional case. Drugs introduced into the spinal canal which are powerful enough to overcome the infection of the meninges are harmful to other organs, substituting new pathological conditions for the meningitis. Dural drainage is effective but to a limited extent. When used in the circumscribed form of the disease it does and should give good results. The successful cases occasionally reported in literature are probably of this class. Drainage of the cisterna magna has not, in a limited experience, come up to expectation, but represents a distinct step in advance toward successful therapy. The three cases of dural drainage which recovered were all complicated by brain abscess secondary to chronic purulent otitis media—in one, cerebellar; in the other two, temporosphenoidal, the meningitis beginning shortly after the operation for the abscess in each case. Though these cases presented all the clinical and laboratory evidence of diffuse meningitis, they may have been simply cases of localized meningitis, limited to an elliptical area, approximately 4 inches in its long diameter by [illegible] inches in the short, situated on the outer and under surface of the temporal lobe and cerebellar lobe of the left side, into which no staining fluid penetrated in an injection experiment by the writer. In eight autopsies of cases in which dural drains had been used this clear area was noted, while beyond this region thick purulent exudate was abundant.

Salvarsan in the New-born.—Chambrelent (*Arch. mens de d'obst. et de gyn.*, *Feb.*, 1913) finds that in his observations of cases of congenital syphilis the administration of salvarsan by the indirect method, through the milk of its mother, is unsatisfactory and uncertain. The direct method is much to be preferred, by injections of salvarsan in small amounts and divided doses. While this method will render signal services it should not be used to the exclusion of the old treatment by mercury and iodide of potash. Salvarsan is especially indicated in cases in which there are serious manifestations of syphilis on the skin and mucous membranes, which should be made to disappear rapidly, or when the mercurial treatment has not given satisfactory results. The injections should be made subcutaneously or intramuscularly. The maximum dose should be 10–15 milligrams per kilogram of body weight, repeated only after tolerance has been established.

Suprarenal Origin of Acetonemic Vomiting.—E. Terrien (*Ann de. med. et chir. inf.*, Apr. 15, 1913) believes that cyclic vomiting in children, sometimes called acetonemic vomiting, is often caused by passing suprarenal insufficiency. If this is so opotherapy will be of great value in the treatment of such cases. The author reports three cases in detail, from which he draws the following conclusions: rapid cessation of symptoms, or marked relief from them followed the use of injections of adrenalin. The signs of suprarenal insufficiency are asthenia, varying from simple lassitude to complete depression and semisomnolence; lumbo-abdominal pains, digestive troubles, and circulatory disturbances varying from hypotension to syncope and sudden death. These same symptoms may be seen in acetonemic vomiting. Similar symptoms seen in incoercible vomiting in pregnancy and in typhoid fever have yielded to the use of adrenalin. If we can have anatomical confirmation of these facts in the form of autopsies on fatal cases we shall be in a position to state the facts more certainly. In such autopsies no note has been made of the condition of the suprarenal capsules. One complete autopsy has shown fatty degeneration of the liver and a hemorrhagic focus in the left suprarenal capsule. The hepatic insufficiency noted in cyclic vomiting may be the result of a general intoxication.

Radiological Diagnosis of Miliary Tuberculosis in the Nursling.—L. Ribadeau-Dumas and Albert Weil (*Ann. de méd. et chir. inf.*, April 15, 1913) assert that they have proven that by radiology we may detect acute pulmonary tuberculosis inin fants. In the cadaver very beautiful pictures of miliary pulmonary tuberculosis can be obtained. In the living subject the thorax must be immovable, in apnea, therefore the radiographs must be instantaneous. The authors have made plates in three cases. For the demonstration of bronchial adenopathies fluoroscopic examination is better than instantaneous radiography, because the child must be examined in different positions, and for this the fluorescent screen is much more easy to manage. In three children dying with tuberculous meningitis and examined a few hours before death, they found little, rounded, miliary spots very uneven in size scattered throughout the lungs. The bronchial adenopathies were hardly to be seen. In a fourth case the child was in a typhoid state, with a large liver, spleen, and an oscillating temperature, and a positive skin reaction. There were disseminated bronchial râles. Rapid radiography showed throughout the right lung and the upper lobe of the left lung an infinite number of little shadows, thus establishing the diagnosis of miliary tuberculosis of a typhoid form.

Antiemetic Properties of Sweetened Condensed Milk.—Variot, Lavialle and Rousselot (*Ann. de méd. et chir. inf.*, April 15, 1913) have found that the use of sweetened condensed milk has an excellent effect on incoercible vomiting of infants. They have systematically administered this form of milk in twenty cases, of which they give the detailed histories. All these were dyspeptics and vomited repeatedly whatever was given them until they took the condensed milk. The vomiting ceased almost always the day after beginning the use of condensed milk. The digestive functions became regularized, the stools became a normal yellow, weight increased, and the infants looked well. The increase in weight was greater than that in stature. The unsweetened condensed milk has not this effect of preventing vomiting; as soon as the use of the sweetened milk is interrupted the vomiting reappears. This condensed milk is not sterile but the large proportion of sugar that it contains assures its keeping.

Massage in the Treatment of Disorders in Children.—J. Phillips (*Amer. Jour. Med. Sci.*, 1913, cxlv, 504) calls attention to the value of massage especially in cases of malnutrition with loss of appetite, weak flabby muscles and loss of appetite. Great benefit is obtained from massage in the treatment of rickets, the muscles in these cases being flabby, the circulation weak, and the extremities emaciated. By massage combined with other exercises the deformity due to scoliosis may be completely corrected before there is any or much change in the vertebræ. After the acute stage of poliomyelitis massage is the most important therapeutic measure available for the paralyzed muscles. It is also useful for the prevention of spastic contractures in cases of polioencephalitis or other conditions in which there is upper neurone destruction. For the treatment of constipation it is just as serviceable as in adults. Nervous children are greatly benefited by rest in bed, careful feeding, and massage. In cardiac lesions the result of acute rheumatism, massage with passive and then resisted movements will allow the patients to get up stronger after the necessarily prolonged rest in bed for weeks or months.

Persistent Ductus Botalli.—Study of the orthodiagrams of five cases diagnosticated as persistent ductus Botalli has convinced H. Wessler and M. H. Bass (*Amer. Jour. Med. Sci.*, 1913, cxlv, 543) that in pure patent ductus arteriosus one need not expect enlargement of the heart or alteration of its shape, and that the presence of these changes suggests an associated or complicating lesion.

Empyema.—A formalin-hardened cadaver specimen of an empyema undisturbed by an opening during life is difficult to obtain. From a study of such a specimen and a few clinical cases, T. T. Thomas (*Amer. Jour. Med. Sci.*, March and April, 1913) concludes that the extent and nature of the adhesion formation in connection with empyemas, especially the acute variety, are not appreciated. The massive parietal type usually extends to the bottom of the normal pleural cavity and is not unencysted or general, but completely walled off above from the rest of the pleural cavity by adhesions. This explains, in the writer's opinion, the slight movability of the dulness after changes in position, as well as the fact that the upper level of the dulness is not in a straight line, as he thinks it should be if the fluid was unencysted and free to seek its own level. [He does not refer to or attempt to explain similar physical signs in the case of serofibrinous pleurisy without limiting adhesions.]

Different Wassermann Reactions in Twins.—Cassoute (*Ann. de méd. et chir. inf.*, May 1, 1913) found that the Wassermann reaction in twins differed, being positive in one, negative in the other. Both parents were apparently free from syphilis. The test was made 21 days after birth. The researches of Bar and Dumay have shown that the anticomplementary power of the serum is always congenital and disappears some weeks after birth. In one of these twins the anticomplementary powers had disappeared, in the other they were still present. Prudence would dictate that we should not consider a positive Wassermann in a young infant a proof of the presence of syphilis, but should delay our judgment and modify it by the symptoms and history of the parents.

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ORIGINAL COMMUNICATIONS.

EMPTYING THE UTERUS AS A METHOD OF TREATMENT OF PUERPERAL ECLAMPSIA.*

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EVERY discussion of the treatment of eclampsia must be prefaced by the admission that the real cause of the condition is unknown. Theories there are in plenty for hardly a month elapses without the promulgation of some new explanation of the cause of eclampsia. We note the new theories or recognize an old theory rearranged to suit the fancy of the writer, forget them very quickly, and treat the next case of eclampsia according to our own conception of the cause of the complication.

Yet after all we are in more accord than at the first glance would appear to be the case. For at the present time it is pretty generally accepted that puerperal eclampsia is due to a toxemia, a poisoning of the system induced by the pregnant state. The pathologic changes in the liver, kidney, and brain, brought about by this poisoning, are easily recognizable, although the exact nature of the poison or where it is elaborated is still unknown. Also we are pretty well agreed that in general the treatment of the eclamptic condition must be along the line of elimination, whereby the organism is enabled to rid itself of the poison. But having peacefully traveled together up to this point, when it comes to treatment we separate and rearrange ourselves into groups, each party feeling sure that it has the better of the argument as far as the results of its particular treatment is concerned. Considering that by our own confession, we do not know the real cause of eclampsia, and since from necessity our treatment must be empirical, we should not be too positive regarding the accuracy of our conclusions. A line of treatment giving good results to-day may woefully disappoint us to-morrow, especially if our conclusions be drawn from our own cases which necessarily must be comparatively few in number, no matter how large the material to which we have access. It is indeed difficult to restrain one's enthusiasm over a certain kind of treatment, say in fifty cases of eclampsia, where the maternal mortality has been reduced to 5 or 10 per cent. Still we must learn to withhold our final judgment upon such treatment if we are to be guided by the experience of other series of eclamptic cases. For we have no means of estimating the severity of the eclampsia in the patients who survived such treatment. Certainly the number of the convulsions or their severity are no good criteria of the degree of intoxication from the eclamptic poison, since patients have lived after many convulsions under all kinds of treatment and have died after one apparently mild convulsion. Examination of the urine or attempts to judge of the changes in the maternal metabolism only aid us in a general way in judging of approaching eclampsia or the severity of the seizures. It has always seemed to me that the true value of any line of treatment can only be determined by collecting, analyzing, and studying a large number of cases of eclampsia subjected to different methods of treatment. Even then we must bear in mind that the mere survival or death of an eclamptic does not tell the whole story. Other factors beside the ones we are scrutinizing closely may have had much to do with the results one way or another.

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While it may be true that one can prove almost anything by the statistical method, it is also true that statistics honestly and impartially scrutinized will reveal many truths, and after all that is what we are after, the truth. Let it be said to the credit of physicians as a class, that they are not wedded to any particular line of treatment for any disease whatever. Unlike the law, nothing that is old and tried is sacred, provided the doctor be convinced his patient is to be bettered by a new line of treatment.

To-day we have under discussion two diametrically opposite kinds of treatment of antepartum eclampsia; one, of which my good friend Dr. Zinke is an exponent, consists of treating the convulsions and letting the pregnancy take care of itself; the other consists in emptying the uterus as soon as possible after the first convulsion and following this up by eliminative treatment.

Off hand, without considering the results of the two methods of treatment, the emptying of the uterus would appeal to the average obstetrician; perhaps not exactly the emptying of the uterus but the desirability of having the uterus empty. For there is no gainsaying the fact that the presence of the fetus is the underlying cause of the eclamptic condition of the mother, whether eventually it be proved that eclampsia be of maternal or fetal origin. Postpartum eclampsia, to be sure, occurs with the uterus empty, but it is the result of an intoxication brought about by a pregnant uterus, not lessened sufficiently by the emptying of that uterus to prevent the eclamptic convulsive explosion during the puerperium.

Every advocate of the medicinal or so-called conservative treatment of eclampsia would be much better pleased, when confronted with a case of antepartum eclampsia, if the uterus were soon to be empty. Dr. Zinke practically makes this confession when he advocates the emptying of the uterus if medicinal treatment of eclampsia fails to bring about prompt amelioration of the patient's condition, and incidentally he shows very clearly why the operative treatment of eclampsia up to this time has been handicapped. He says, give veratrum viride, give hot baths and apply the hot packs and then, if the fight is going against you and the patient about to die, then and only then empty the uterus. He might have added "then count up that case against the operative treatment of eclampsia, since the uterus was emptied, was it not, and the patient died."

Presently I shall show that with over a thousand cases and not with dozens, the operative treatment of eclampsia, that is, the emptying of the uterus, in spite of this handicap of operating only as a last resort and by poor methods, gives a maternal mortality less than Dr. Zinke reports under the medicinal treatment in his twenty-six cases. But first I want to emphasize the fact that from a statistical standpoint the operative treatment of eclampsia never has had a fair show. Well do I remember the first case of eclampsia I ever saw. It was in the late eighties when I was a hospital intern. The patient, a primipara at term, was brought into the hospital in convulsions. My good old chief was sent for and at once decided that the uterus must be emptied. With the woman under an anesthetic where one was not needed, so deeply unconscious was she, he used first one hand and then the other in his efforts to dilate the cervix. When he could do no more, he asked me to spell his paralyzed hands, then he went at it again until the cervix was finally dilated and the woman delivered, I forget how, of a dead baby. The mother died within two days. Was that giving the operative treatment of eclampsia a fair chance? It would seem to me not, and yet statistics made up of just such cases show better results than where the women have been treated medicinally and have delivered themselves.

Two years ago I collected some statistics in connection with an article I prepared on Vaginal Cesarean Section in eclampsia. Table I taken from that article, shows in a striking way the advantages of prompt delivery over the expectant method of treatment.

TABLE I.—SHOWING THE RESULTS OF PROMPT DELIVERY AND THE EXPECTANT PLAN OF TREATMENT OF ECLAMPSIA.

	Prompt delivery		Expectant treatment	
	Number of cases	Mortality percentage	Number of cases	Mortality percentage
Bumm-Liepmann	104	5 = 4.8	90	28 = 31.1
Esch (1904–1906)	101	20 = 19.8	79	20 = 25.3
Esch (1905–1906)	36	8 = 22.2	145	42 = 28.9
Glockner	115	20 = 17.3	9	3 = 33.3
Möhlmann	104	16 = 15.3	10	1 = 10.0
Winter	75	17 = 22.6	8	3 = 40.0
Zweifel	80	12 = 15.0	49	16 = 32.6
Total	615	98 = 15.9	390	113 = 28.9

TABLE II.—SHOWING RESULTS OF IMMEDIATE DELIVERY AND CONSERVATIVE TREATMENT OF ECLAMPSIA.

	Immediate delivery		Conservative treatment	
	Number of cases	Mortality percentage	Number of cases	Mortality percentage
Liepmann	79	2 = 2.5	90	27 = 30.0
Seitz	19	2 = 10.5	....	28.3
Winter	22	0 = 0	8	3 = 37.5
Zweifel	30	2 = 6.6	49	16 = 32.6
Total	150	6 = 4.0	147	46 = 31.2

It will be seen that the maternal mortality with prompt delivery in eclampsia was 15.9 per cent., while in the same clinics under the expectant plan of treatment the mortality was 28.9 per cent. Zweifel had a mortality of 32.6 per cent. under the expectant plan of treatment, while the maternal mortality was reduced over half or to 15 per cent. when the eclamptic patients were delivered immediately after they entered the clinic. The mortality in turn rose to 23.5 per cent. when prompt delivery was not employed as frequently.

Table II shows the results of immediate delivery in 150 cases of eclampsia to be only 4 per cent., while under conservative treatment in 147 cases by the same men the mortality was 31.2 per cent. I am aware that to be consistent, I must remind you that the cases in this table are too few in number (150 and 147) to be taken too seriously. Another series might show entirely different percentages, although I believe the figures will always show a lower mortality under treatment by prompt delivery than where there has been delay.

In order to ascertain if these conclusions were correct, since the paper above mentioned I have collected many more cases of eclampsia with the idea that the question can be settled statistically only by the study of such large groups of cases.

Some very interesting facts are brought out in Tables III and IV, which I have condensed and arranged for your inspection. As will be seen, I have estimated the mortality after spontaneous and operative delivery in a large number of cases into two groups. The first, Table III, includes cases occurring before 1900, while the second, Table IV, includes cases between 1900 and 1912.

This group arrangement becomes necessary if we are to judge of the results of operative delivery in eclampsia through an estimate of the mortality. In a general way it serves to separate the cases where many deaths were caused by sepsis from the cases in the later period where presumably aseptic methods were employed and the deaths resulted from the eclampsia. This is not exactly true for reasons which I shall explain later, but at least it is approximately correct.

We see from these tables that prior to 1900 in 1126 cases of eclampsia, the maternal mortality was 23.35 per cent. where the women delivered themselves, while in 1443 cases where operative delivery was employed the mortality was higher, that is, 28.13 per cent. While this is not particularly favorable for spontaneous delivery in eclampsia it certainly shows itself superior to the treatment by operative delivery by 5 per cent. But wait before we jump at conclusions. If this were true before 1900 it ought to be true after 1900, unless, and here is the point, the accoucheurs were becoming more aseptic operators or were operating more quickly after the onset of the convulsions. Now, the medicinal treatment with spontaneous labor has changed but little during the two periods unless we count those who have become converted to the veratrum viride treatment. The change has come in the other side of the equation, on the operative side, with the result that the figures are reversed. For in 290 cases

TABLE III.—MATERNAL MORTALITY AFTER SPONTANEOUS AND OPERATIVE DELIVERY IN ECLAMPSIA.
Prior to 1900.

	Spontaneous			Operative		
	No. of cases	No. of deaths	Percentage mortality	No. of cases	No. of deaths	Percentage mortality
Olshausen	111	24	21.6	77	16	20.8
Goedecke	97	27	27.83	192	31	16.1
Buettner (1881–1891)	41	15	36.5	75	19	24.66
Buettner (1892–1899)	162	31	19.13	162	34	20.97
Glockner	10	3	30.00	114	20	17.5
Bumm	61	18	29.5	27	8	29.6
Liepmann	180	41	22.77	...	...	...
Dührssen	38	8	21.00	80	19	23.75
Goldberg	...	...	16.28	38	13	34.21
Knapp	5	0	00.00	17	1	5.88
Schauta	73	16	21.90	153	73	47.71
Schreiber	59	12	20.33	78	15	19.23
Green	3	0	00.00	18	8	44.44
Paupertow	168	54	38.7	110	67	61.3
Baskin	43	5	11.63	84	18	21.43
Leske	7	1	14.28	29	5	17.24
Lantos	19	3	15.78	37	12	32.43
Ostrcil	22	2	9.09	51	15	29.41
Bayer	10	1	10.00	26	8	30.76
Meyer-Wirz	7	2	28.57	58	22	37.93
V. Braitenberg	10	0	00.00	17	2	11.76
Total	1126	203	23.35	1443	406	28.13

TABLE IV.—MATERNAL MORTALITY AFTER SPONTANEOUS AND OPERATIVE DELIVERY IN ECLAMPSIA
Between 1900 and 1912.

	Spontaneous			Operative		
	No. of cases	No. of deaths	Percentage of mortality	No. of cases	No. of deaths	Percentage of mortality
Esch	77	16	20.8	267	45	16.8
Möhlmann	10	1	10.0	94	15	15.95
Daels	19	3	15.7	301	39	12.9
Seitz (München. Klin.) 1903–1907.	1	1	100.0	21	4	19.4
Zinke	26	4	15.38	...	...	...
Lichtenstein (1900–1911)	87	20	22.96	300	40	15.85
Lichtenstein (1911–1912)	24	00	00.00	21	5	23.8
Freund (1904–1912)	44	11	25.00	355	56	16.8
Meyer-Wirz (1900–1904)	2	1	50.00	24	4	16.66
Liepmann	...	...	...	104	5	4.8
Total	290	57	18.96	1496	222	14.83

of eclampsia with spontaneous labor between 1900 and 1912, Table IV, the maternal mortality is 18.96 per cent., while in 1496 cases treated by operative delivery the maternal mortality is only 14.8 per cent., an advantage of 4 per cent. in favor of the treatment by operative delivery.

It may be asked, if the operative treatment for antepartum eclampsia is so favorable, why is it that the maternal mortality was so high (23 per cent.) in the 530 cases of eclampsia treated by vaginal Cesarean section. The answer is that operation was too long delayed in many of the cases. If we take the number of convulsions as a criterion as to the time the operation was performed, we see that the mortality was lowest where it followed upon very few convulsions. In 237 cases where there were only from one to five convulsions preceding the operation the maternal mortality was reduced from 23 to 18 per cent. Olin, who from the nature of his statistics was able to estimate accurately the time elapsing between the first convulsion and the operative delivery of the patient, found the mortality in thirty-one cases delivered one to three hours after the onset of the first convulsion to be only 3 per cent. On the other hand, in fifty cases delivered from six to twenty-four hours after the first convulsion, the mortality was 28 per cent.

Those opposed to the treatment of antepartum eclampsia by operative means claim that the trauma incident to forcible delivery is enough to turn the scale against the eclamptic patient whose system is already overwhelmed by poison. There is some truth in this contention provided the old order of obstetric surgery prevail. To spend two or more hours delivering the eclamptic patient under an anesthetic is bad practice and cannot help but injure to a certain extent the patient's chances of recovery. Still we have seen that with this against operative delivery as a treatment of the complication under discussion, the results were 4 per cent. better than where the patient was treated medicinally and spontaneous labor awaited. That is why vaginal Cesarean section has appealed to me as a method of emptying the uterus of the eclamptic patient. Except where there is a pelvic contraction or where for some reason the cervix cannot be pulled down, the operation can easily and quickly be performed with minimum shock and trauma to the patient. I am convinced that greater experience with this particular operation will show better results in the future, provided, and this must be especially emphasized, provided the patients be operated upon early in the disease before the eclamptic poison has so effected the liver, kidney, and brain as to make all treatment, including the operative, of no avail.

I for one am perfectly willing to accept the challenge of Dr. Zinke to let the future decide between the two methods of treatment. As much as I admire Dr. Zinke as an obstetrician and a teacher, I am convinced that he is wrong on this question. As I look at it, his dictum "treat the convulsions and let the pregnancy take care of itself" is far from being good teaching, since, because of just such teaching the patient is temporized with, subjected to hot baths, hot packs, and drugs, while the underlying cause of the eclamptic condition, the pregnancy, continues. I believe, also, that his statement that surgery has contributed very little to the reduction of the maternal mortality of eclampsia is also far from being correct. I have endeavored to show why obstetric surgery has not accomplished more in the treatment of this dread complication. Give it a fair chance, and results will show how much it will accomplish. Don't delay operation in eclampsia until you have a patient overwhelmed with the poison any more than you would delay in appendicitis until the patient has suppurative peritonitis. In judging the value of operative procedure in such cases, one feels perfectly justified in not counting them, or considering them in the same category with neglected strangulated hernia cases. We think such results due to neglect and delay or poor judgment. In the same way, the time will come when failure to see that the uterus is emptied quickly after the onset of the first convulsion will be considered an error of judgment.

Now, I do not propose to take issue with those advocating the use of veratrum viride in eclampsia. It may and probably does serve a useful purpose in a certain class of cases. That it needs to be administered with care has been demonstrated by Bailey who finds that considerable shock attends its use. I simply class this remedy with others recommended for antepartum eclampsia and refrain from its use so long as the patient is undelivered. Elimination by the skin, bowels and kidneys should be sought for after and not before delivery, else valuable time will be lost, because all such treatment is carried on at a disadvantage before the uterus is emptied. After the latter has been accomplished use every means at your command for elimination of the eclamptic poison.

Lack of time prevents me from discussing the conservative and radical treatment of antepartum eclampsia from the standpoint of the fetus. Each year the latter's rights are receiving more and more attention and this is as it should be. Before the age of viability of the child, the safety of the mother demands rapid delivery irrespective of the fetus. When the child is viable, only those methods of treatment of the eclampsia should be chosen which will best guard the interests of each. As I have endeavored to show in another paper, this is not accomplished as far as the child is concerned by delaying delivery until the fetus as well as the mother is poisoned.

While my tables show that the fetal mortality is 6 per cent. better for the fetus with spontaneous labor in eclampsia, they also show that under improved obstetric surgery from 1900 to 1912 the fetal mortality with operative delivery has been reduced from 41.17 per cent. to 28.6 per cent. I am confident that with a more careful choice of operative procedures and with more prompt deliveries the fetal mortality will be still further reduced. I am supported in this belief by the results of vaginal Cesarean section in eclampsia. With 315 children, the fetal mortality was only 21.2 per cent. This was still further reduced if we take only those cases where only three convulsions occurred before the birth of the children. Here the fetal mortality was only 11.8 per cent.

CONCLUSIONS.

1. Since the cause of eclampsia is still unknown, its treatment must of necessity be empirical.

2. Only through the analysis of large numbers of cases can the value of any particular treatment be correctly estimated.

3. In a large series of cases of eclampsia prompt delivery gave a maternal mortality of 15.9 per cent., as compared with a maternal mortality of 28.9 per cent. where the delivery was long delayed.

4. Where the uterus is emptied immediately or very soon after the onset of the first convulsion, the maternal mortality is still lower.

5. While in a large group of cases the maternal mortality is 5 per cent. in favor of conservative treatment and spontaneous labor in cases occurring before 1900, between 1900 and 1912, on account of better and more prompt obstetric surgery the figures are reversed and show that the maternal mortality is lower by 4 per cent. after the radical opposed to the conservative treatment of the complication.

6. Therefore, the treatment of antepartum eclampsia should consist of emptying the uterus as quickly as possible after the onset of the first convulsion.

7. The operative procedure which will empty the uterus the quickest with minimum trauma and shock to the eclamptic mother and child should be selected.

THE ELASTIC AREA IN THE ISTHMUS OF THE UTERUS A POSITIVE AND EARLY SIGN OF UTERINE PREGNANCY.*

BY
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(With Four Illustrations.)

The diagnosis of early uterine pregnancy is a very important factor in the diagnosis of diseases of women and is absolutely essential in the differentiation of certain pathological conditions of the pelvis, especially in the recognition of abnormal pregnancy. Notwithstanding its importance, the subject is surrounded by doubt and indecision, and the view prevails that there are no positive diagnostic signs of early uterine pregnancy.

Thus, to quote from a few of the standard text-books: In "Gynecological Diagnosis," page 124, by Winter and Ruge we find the following statement: "It is therefore the part of wisdom on the part of the physician not to announce or exclude this condition, which brings such a momentous change into a woman's life, until the diagnosis is established beyond the possibility of a mistake. If there is any doubt it is wiser to wait a month longer." Because the question of uterine pregnancy solves itself sooner or later, we are cautioned against making a diagnosis until it can be made with certainty.

To be able to diagnosticate early uterine pregnancy is always extremely desirable, and is at times of the greatest concern to the life of the patient, and yet no less an authority than Williams in his Obstetrics (page 157) tells us that: "Unfortunately it is just at this point that our diagnostic ability is restricted" for "mistakes in diagnosis are most frequently made in the first months of pregnancy"; and Edgar (page 119) in his splendid text-book, says that: "A number of symptoms and signs taken together give certain evidence of the presence of pregnancy, and single signs, especially in the latter part of pregnancy, render the diagnosis probable or even positive."

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De Lee, in his book on Obstetrics, just published, asserts: "In the early months there is no absolute sign of pregnancy;" and Findley, in "Diagnosis of Diseases of Women," makes the following statement: "There are no positive signs in the first trimester except seeing the fetal structures and decidua, but when two or more presumptive or highly presumptive signs are present, the diagnosis of pregnancy amounts to a moral certainty."

The multiplicity and indefiniteness of the objective signs and subjective symptoms that are generally depended on for the diagnosis of early pregnancy, have certainly not served to elucidate the subject, as will be seen from the following classification of signs, given by Findley, which I take the liberty of quoting as representing the teaching of the best text-books:

SUBJECTIVE SIGNS.

1. *Cessation of Menstruation.*—Value of the sign: In a woman of the child-bearing period, who has previously been regular, cessation of menstruation is a *highly probable* sign.

2. *Morning Sickness.*—Occurs commonly between the fourth and eighth weeks; earlier and more frequently in primiparæ. Value of the sign: *Highly presumptive* when associated with amenorrhea.

3. *Salivation.*—Rarely present after the fourth week, and is of *no special value* as a sign of pregnancy.

4. *Nervous Phenomena.*—Value of the sign: *Negative.*

5. *Irritable bladder* due to the size and weight of the uterus. Value of the sign: *Negative.*

OBJECTIVE SIGNS.

1. *Changes in the Mammary glands.*—Value of the sign: *Highly presumptive*, especially in young primiparæ.

2. *Discoloration of the vulva and vagina* may occur as early as the sixth week or as late as the eighth month. Value of the sign: *Presumptive.*

3. *Softening of the vaginal portion of the cervix* generally begins at the fourth week, earlier in multiparæ. Value of the sign: *Highly presumptive.*

4. *Softening and compressibility of the lower uterine segment* (Hegar's sign). Value of the sign: *Very reliable, though not a positive sign.*

5. *Leukorrhea.*—Often begins early and persists throughout pregnancy. Value of the sign: *Negative.*

6. *Changes in position, size and consistency of the uterus.* Value of the sign: *Highly presumptive.*

As regards the value of the above signs, cessation of menstruation is regarded as highly probable, and Hegar's sign as very reliable though not positive; the others are either only presumptive or negative.

I am thoroughly in accord with the statement of Winter and Ruge (page 128), that: "The change in the consistency of the uterus is the most positive sign of pregnancy." I might add, especially the change in the consistency of the isthmus. The other signs should be given due consideration, but only in the nature of corroboration.

In a paper read before the meeting of the Section on Obstetrics and Gynecology, at the New York Academy of Medicine, February 28, 1907, and published in the *Medical Record*, April 13 of that year, I called attention to the elastic area at the isthmus of the uterus as a positive sign of early pregnancy. It is indeed not at all surprising, in view of the advocacy of so many indefinite and doubtful signs, that the only pathognomonic sign, by the presence or absence of which the diagnosis of early pregnancy can be made or excluded, is overlooked.

THE ELASTIC AREA IN THE ISTHMUS—A POSITIVE SIGN OF EARLY PREGNANCY.

The change I have invariably found in early uterine pregnancy consists of a circular area situated in the median line of the anterior surface of the body of the uterus, just above the junction of body and cervix, that is to say at the isthmus of the uterus, which varies in size according to the duration of pregnancy, and offers to the palpating finger the distinct sensation of elastic fluctuation. It can frequently be made out as early as the fifth week, when the area is only the size of a fingertip; but it can always be felt in the sixth week, when it is somewhat larger. As pregnancy advances this area increases in size in a crescentic manner, and extends upward toward the fundus until the third month of pregnancy, when nearly the entire anterior body of the uterus presents a *fluctuating, cystic* feel to the examining finger.

The change in the consistency is observed in the anterior wall when the pregnant uterus is in the normal position or slightly retroverted; in extremely retroverted or retroflexed uteri the elastic area is found in the posterior wall, but the sign is usually felt a week or so later than in uteri of normal position.

Bimanual palpation is a prerequisite in eliciting this sign; while the uterus is fixed by counterpressure with the external hand, the anterior wall of the uterus, from the tip of the cervix to the fundus, is palpated with the internal finger or fingers, and if pregnancy exists, the elastic, fluctuating area will be felt in the median line of the body of the uterus, immediately above the cervix. There is no special skill or dexterity required to recognize this elastic area; the ordinary technic and tactile sense necessary in the performance of bimanual palpation, will readily detect the difference in the consistency of the isthmus, and a proper interpretation of the character of this change will invariably establish a correct diagnosis. This can be done by the general practitioner as readily as by the specialist; a fact that enhances the importance and value of the sign.

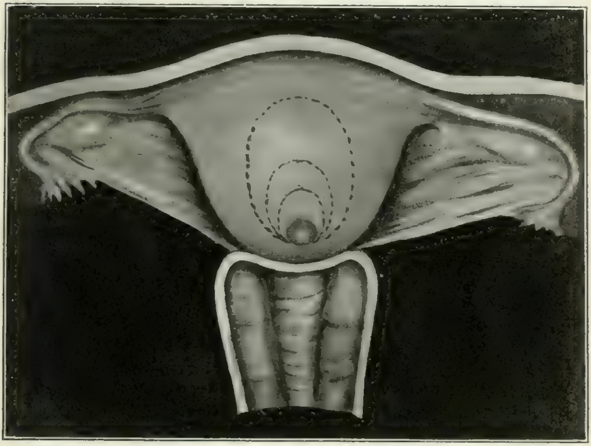

FIG. 1.—Elastic area at the 5th or 6th week and crescentic enlargement as pregnancy advances.

VARIOUS INTERPRETATIONS OF THE CHANGE IN CONSISTENCY.

From time to time writers have called attention to a change in the consistency of the isthmus or body of the uterus as an indication of pregnancy, though no two observers have interpreted or described it in the same manner. Among them I shall mention the following:

1. As early as 1799, John Burns, of Glasgow, in his book, "The Anatomy of the Gravid Uterus," called attention to the irregularity and softening of the uterus during the early part of pregnancy.

2. Hegar's sign, as at first described by Rheinl(1) consists of softening, compressibility and thickening of the entire lower uterine segment, and is elicited by introducing one or two fingers into the posterior vaginal fornix and approximating the fingers of the hand over the abdomen as closely to the fingers in the vagina as possible. The lower uterine segment may be compressed to the thinness of paper.

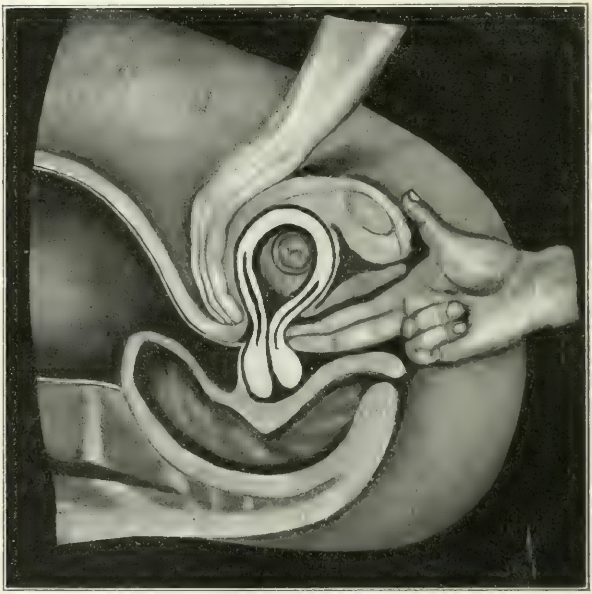

FIG. 2.—Compressibility of lower segment of uterus (Hegar's sign) and method of obtaining it. Black lines in anterior and posterior walls of uterus indicate extent of compressible area.

The investigations of Rheirl, Hegar and Landau with reference to this sign, showed that it was best obtained from the ninth to the twelfth week of pregnancy; positively in 49 per cent. of the cases examined; moderately in 45 per cent.

Softness and compressibility of the lower uterine segment are undoubtedly always present in the third month of pregnancy, but because it is difficult to detect these changes in some instances, and impossible in others, the claim is made that the sign is only present in a certain percentage of cases.

3. Robert L. Dickinson(2) in 1892, had the following to say on the subject: "The most valuable sign of very early pregnancy was bulging or bellying of the body of the uterus: 40 per cent. found in the anterior surface, 25 per cent. in the posterior surface. Elasticity due to change in the consistency, present in 80 per cent. of the cases—appeared a little later than bulging. A still later sign was compressibility of the lower segment of the uterus, *i.e.*, Hegar's sign. According to Dickinson, Hegar's sign was present in 66 per cent. of the cases. Dickinson also called attention to the asymmetry of the uterus in early pregnancy, and referred to it as causing a furrow dividing the uterus in separate halves.

4. William Gardner(3) in 1897, called attention to the fact that "at eight weeks of pregnancy the uterus is about the size of a large orange, irregular in shape, and cystic." He says: "A cystic uterus is always a pregnant uterus."

5. Von Braun(4) in 1899, maintained that "a change in the consistency of the uterus is the earliest sign of pregnancy. The uterus is irregular of form, thicker on one side, and with a shallow depression anteriorly. This latter symptom can always be made out, and is explained by the engrafting of the ovum on one side."

6. Chas. P. Noble(5) in 1901, said: "There is a sign of great value in the diagnosis of early pregnancy: the characteristic shape and feel of the uterus. As the ovum grows, very soon the pregnant uterus has a semicystic feel, made out as early as the sixth week."

7. Jewett(6) in 1902 made the following significant statements: "Most easily available of the signs obtainable in the early months of pregnancy, by bimanual examination, are marked softening and lateral expansion of the body of the uterus. In no other condition than pregnancy is the softening so marked. This character alone, when pronounced, may safely be taken as proof of normal gestation. No pathological condition counterfeits it. It is partially developed before five or six weeks. It disappears toward the end of the third month."

8. Weissenberg(7) in 1905 noted: "Softening on one side or other,

and never symmetrical." He found softening on left side in 67 per cent.; on right side in 33 per cent.

As regards this sign, Dickinson, Von Braun and others, think the harder, firmer side represents the side on which the ovum is engrafted; while Schauta, and Landau believe the softer side to be the side of gestation.

9. McDonald(8) in 1908 called attention to the flexibility of the isthmus of the uterus as a sign of pregnancy, and stated that the sign is said to be a "new form" of Hegar's sign, and, like it, depended upon the increased vascularity of the pregnant uterus. He concludes that this sign has apparently the same value as Hegar's sign, but maintains that flexibility can be obtained before compressibility of the lower uterine segment.

McDonald, in referring to the Ladinski sign, stated that: "In 100 cases he examined, softening of the uterus occurred symmetrically in 55 per cent., in 47 per cent. it was asymmetrical and to one side of the median line. He adds that "after the tenth week this median softening may no doubt be felt, but before that time the softening may be corneal, or elsewhere."

10. Spire(9) in 1910 stated that: "At the end of the second month there is a change in the shape and consistency of the uterus, the body of the uterus is enlarged, globular, and the change in the consistency is great. It gives sensation of *elastic* softness to the examining finger, like a ripe fig. The region where the cervix and fundus join, undergoes softening such as it seems to yield before the finger, and the body may seem to be separated from the cervix."

Spire's description appears to be identical with the description of the sign I gave in my paper, in 1907.

Of the various interpretations of the changes in the consistency of the uterus, described above, Hegar's is undoubtedly valuable and reliable, notwithstanding the opinions to the contrary. The flexibility of the isthmus of McDonald is also of value.

However, Hegar's sign has the following disadvantages as compared with my sign: First and foremost, it does not as a rule appear until a later period of pregnancy, that is to say, not under two or three months; while the elastic area of the isthmus becomes manifest between the fifth and sixth week, even before the flexibility described by McDonald can be obtained. Again, it requires special skill and practice to elicit Hegar's sign, and this, in my opinion, is also responsible for the prevalent belief that the sign cannot be obtained in a certain percentage of cases. If, as McDonald admits, the "maneuver" to obtain the sign of flexibility requires some little practice, and some experience in the firmness of the unimpregnated uterus, it is obvious that it requires more than ordinary skill and experience to approximate by bi-manual palpation the anterior to the posterior surface of the lower uterine segment to obtain Hegar's sign.

The elastic area in the isthmus, constituting my sign, is not only always present in the sixth week of pregnancy, but it can invariably be felt at that time without any difficulty, requiring no special skill or practice beyond bimanual palpation of the anterior wall of the uterus, with special attention to the consistency of the isthmus.

I want to again emphasize the fact that the author's sign, *i.e.*, elasticity of the isthmus, must not be confused with Hegar's sign *i.e.*, softening, thinning and compressibility of the entire lower uterine segment. The former sign is analogous to Hegar's and McDonald's in so far that it is probably due to the same vascular changes; but as a physical sign it bears the same relationship to Hegar's in regard to early appearance, as does McBurney's point to a tumor in the iliac fossa in the diagnosis of appendicitis. While in a large percentage of cases Hegar's sign can be depended on between the second and third month, the writers sign can be relied on from the fifth or sixth week to the third month, and in almost all cases.

The advantages of the writer's sign over Hegar's, namely: earlier appearance, constant and invariable presence, ease and facility in detection, would in themselves warrant the general acceptance of this sign, even it it were only a modification of Hegar's sign; but as a matter of fact, a study of the changes in the consistency of the uterus that form the basis of Hegar's sign and the author's sign, and a comparison of the methods employed in obtaining the signs—as will be seen from the diagrams—will convince any observer that they are absolutely different and distinct.

The object in presenting this communication is not to claim originality in the discovery, but to call attention to my experience with this valuable sign for a period of over twenty years.

As the result of a careful study of extensive clinical material, the conclusion is absolutely justified that this sign is not only constant and reliable and can be detected with greater ease than any other objective sign, but that it is undoubtedly the earliest sign of pregnancy.

Any change from the normal in the consistency of the isthmus of the uterus may be regarded with suspicion of pregnancy. The only conditions that show a change in the consistency of the isthmus, are pregnancy, subinvolution, *i.e.*, the result of pregnancy, and cystic tumors in the anterior wall of the uterus.

In subinvolution, following delivery at term or abortion, there is a change in the same area, but the feel is very soft and doughy, in contradistinction to the tense, elastic and cystic feel of pregnancy. However, in the presence of a soft myoma, or cystic fibroid in the anterior wall of the uterus, the elastic feel elicited in the uterine wall is almost identical with that of pregnancy; and this is the only condition which cannot be differentiated from early pregnancy at the first examination. This is especially true when a soft myoma of the uterus is associated with amenorrhea, as is frequently the case. Under these circumstances further observation and repeated examinations will be necessary to establish a diagnosis.

DIFFERENTIAL DIAGNOSIS IN UTERINE, AND EXTRAUTERINE PREGNANCY.

As to the consideration of the diagnosis of early uterine pregnancy and the various conditions from which it is to be differentiated, I will confine myself to a discussion of the most important phase of it, namely, "differential diagnosis between intra- and extrauterine pregnancy."

In the diagnosis of tubal pregnancy the factor that is productive of the greatest doubt, and is the cause of a prolific source of error, is the possible presence or absence of uterine pregnancy. Thus, to quote from Winter and Ruge (page 169): "From the first to the last month (of pregnancy) the difficulties in the way of a correct diagnosis, in this respect, may be so great that even the practised diagnostician may come to grief. In general it may be said that here again, an extrauterine pregnancy is more frequently incorrectly diagnosed than an intrauterine; and accordingly the number of unnecessary laparotomies is by no means small. This tendency to diagnose extrauterine pregnancy too frequently is in part due to the fear of overlooking the condition. *The mistake occurs in cases in which the diagnosis is absolutely positive, both by the history and by the physical signs, but in which certain conditions of the uterus make it difficult to decide whether the fetus is developing within or outside of the uterine cavity.*" Italics are mine.

As the possibility of pregnancy is usually the first condition to which the physician's attention is called by patients who are subsequently found to be suffering from ectopic gestation, it follows that the first and most important question to be decided in the consideration of the diagnosis of every case of possible tubal pregnancy is whether or not the case is one of uterine pregnancy. Confirming a diagnosis of uterine pregnancy will at once preclude the possible diagnosis of ectopic—unless it is a case of combined intra- and extrauterine pregnancy (the possibility of which is exceedingly remote); and *vice versa* with uterine pregnancy eliminated a possible ectopic gestation will less likely be overlooked.

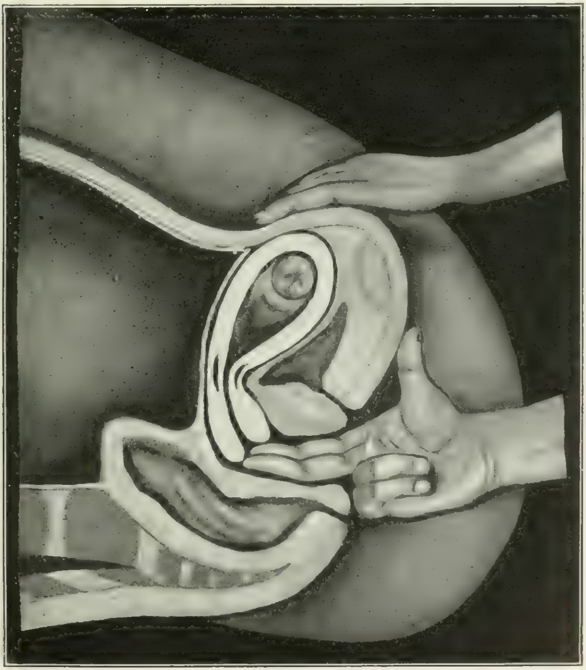

FIG. 3.—Flexibility of uterus (McDonald's sign) and method of obtaining it. Black lines in anterior and posterior walls of uterus indicate the site of flexibility.

Because of the absence of the elastic area in the uterus, I have suspected and diagnosed tubal pregnancy on a number of occasions in patients who were considered to have normal pregnancy. More frequently, however, by means of this sign I was enabled to eliminate a highly presumptive diagnosis of extrauterine pregnancy.

In the cases of tubal pregnancy that have come under my observation (including over 200 operated on by me, and a large number who consulted me and were operated on by others) I found the determination of the presence or absence of uterine pregnancy one of the most valuable aids to a correct decision.

The absence of the elastic area in the isthmus not only eliminates uterine pregnancy with certainty, but, since in tubal pregnancy the uterus, presents no change in consistency at the isthmus, this sign furnishes a negative sign of paramount importance in the diagnosis of tubal pregnancy.

After a more extended experience, I have no hesitancy in repeating and confirming the statement I previously made, that this sign has materially assisted me in arriving at a correct diagnosis of ectopic pregnancy in a large number of otherwise doubtful cases, and is largely responsible for my assertion that the diagnosis of extrauterine pregnancy can be made with as much certainty as any other pathological condition of the pelvis. Moreover, in a number of my list of cases of extrauterine pregnancy, the absence of uterine pregnancy was the principal indication for operation.

The only amplification I have to make of the above is that the sign cannot be made out before the fifth week, and a differential diagnosis is therefore impossible before that period; such cases are comparatively rare, and in these cases we will have to depend on the serum or blood test of Alberhalden for diagnosis; but unfortunately this is at present only available in the later months.

DIFFERENTIAL DIAGNOSIS OF THREATENED, INEVITABLE, AND COMPLETE ABORTION.

In cases of early pregnancy with symptoms of threatened abortion, the area in the isthmus usually remains cystic and elastic so long as the ovum is viable, but becomes soft, doughy, and compressible when the ovum is no longer viable—that is to say in incomplete abortion. Furthermore, in subinvolution following abortion, a change in the consistency of a similar area is also manifest; here again the feel is distinctly soft and doughy, instead of the elastic, cystic feel of pregnancy or threatened abortion.

Thus it will be seen that a correct interpretation of the consistency of this area may also serve to differentiate between threatened, incomplete, and complete abortion.

This is not in accord with the generally accepted view that a diagnosis of the death of the ovum in the early months of pregnancy offers considerable doubt, and can only be made after repeated examinations prove the uterus to remain stationary in size.

CAUSE OF CHANGE.

I am not prepared to offer at the present time, any positive explanation as to the cause of this change in the wall of the pregnant uterus, a subject which I expect to study, and report the results of the investigation in the future; but I confess I do not share the opinion of those who claim that the change in the consistency is due to the engrafting of the ovum, at least not in the early months of pregnancy; on the contrary, I am rather inclined to believe with those who hold that the change is due to a hypertrophic process,

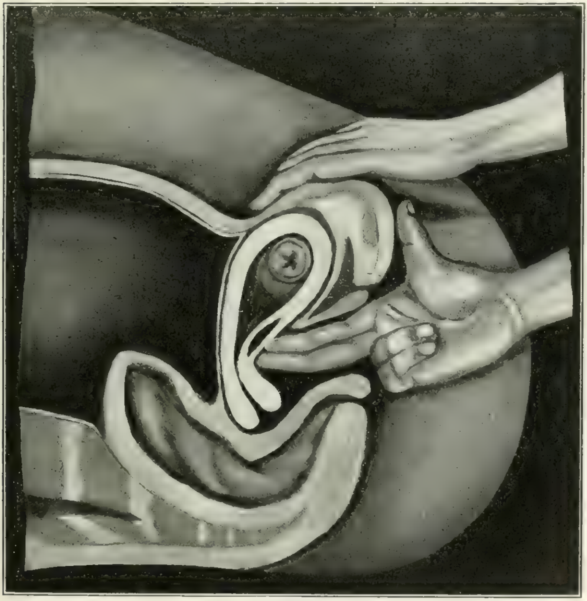

FIG. 4.—Elastic area of isthmus (Author's sign) and method of obtaining it. Black line in anterior wall of uterus indicates site of area at about 6th week of pregnancy.

involving not only the muscular fibers and connective tissue, but especially the vascular-lymphatic structures of the uterus.

The vascular-lymphatic system of the uterus that is first affected by pregnancy, is probably that of the isthmus, and this may be the cause of the characteristic elastic, fluctuating feel found in early pregnancy. Later, however, the fluctuating feel of the body of the uterus is also due to the presence of the ovum.

In recommending this sign to the profession, and in advocating it in such strong terms, I am not unmindful of the fact that very competent authorities are of the opinion that there are no positive diagnostic signs of early pregnancy; but my experience with this sign has been so extensive, and so uniformly satisfactory that I do not hesitate to offer it with every confidence and assurance that it will prove equally satisfactory to all who choose to employ it.

1289 MADISON AVENUE.

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POINTS IN TECHNIC THAT HAVE HELPED ME OUT OF SOME FORMER DIFFICULTIES.*

BY

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(With One Illustration.)

WHEN the president requested me the other day to fill a vacant place on the program for this evening, I gave the secretary the above title, with the purpose of reviewing some of my earlier abdominal work, for the information and possible instruction of our younger members, whose way has been smoothed somewhat by the pioneers; but, I found the task too big to do more than to make a beginning, with the first chapter.

Very little was known of real pelvic surgery when I did my first abdominal section, in February, 1883, a little more than thirty years ago. The case was one of old pelvic abscess which had been discharging through the bladder for a long period; the patient was in extremis from sepsis, and emaciated to the last degree.

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* Read before the Philadelphia Obstetrical Society, April, 1913.

This was after I had served an apprenticeship of seven years on the staff of my good friend and preceptor, the late Dr. William Goodell. I assisted Dr. Goodell in his first ovariotomy, in 1876, a few months after my graduation. This case was one of large ovarian cyst with a small, thin pedicle, which was secured in the lower end of the incision by a formidable steel clamp. The patient recovered, but died three years later from cancer, which started in the portion of the pedicle which had been fastened outside.

This was, I believe, the only instance in which Dr. Goodell used the clamp in ovariotomy; but he continued its use in the treatment of the hysterectomy stump, by the extraperitoneal method, until 1892. It was the behavior of these sloughing hysterectomy stumps that caused me to resolve never to take up hysterectomy myself until I could treat the cervix inside, by a method and technic that would promise success. This came in 1891, when the revolution against all clamp methods was realized.

But to get back to my first abdominal section: The patient died the next day, and I presented an elaborate report of the case at the next meeting of our Obstetrical Society just thirty years ago this evening. (AMER. JOUR. OBST., June, 1883). I called it, "A case of Suppurating Cyst of the Broad Ligament," but I learned later that its true origin was probably tuboovarian. I used the carbolic spray and some other cumbersome, nonessential antiseptic trappings. I never used the spray afterward, and I soon became a convert to simple asepsis, which meant to me the destruction of virulent bacteria by measures which did not also tend to destroy the patient as well.

Then, sixteen months passed before I had an opportunity again to operate. This was done in a miner's hut on a mountain side in Elk County, Pennsylvania, with the County Society, consisting of some half dozen members, assisting. The only preparation the patient had was a laxative the day before, and the nursing was that which the neighboring women could give her. The mountain water was boiled and the abdominal surface was washed with it and soap, after anesthesia. Soap and water were used to sterilize the hands. The patient, twenty-four years of age, had been ill only six months, with a rapidly enlarging abdomen, and rapid, general emaciation. The tumor proved to be solid—or nearly so—of the left ovary. It was necessary to extend the incision the entire length of the abdominal wall before the tumor could be lifted out. Here is a picture of it. The incision was closed without drainage and the patient recovered without event. The point I learned from this experience was that the destruction of microorganisms, either by shooting them on the wing with the spray, or by scrubbing them out of the skin with germicidal solutions, or by permitting their escape through a drainage tube, did not seem to be as necessary, as we were then taught.

This and my subsequent experience caused me to place more reliance upon the surgery, which includes the anesthesia, than on anything else. The proper administration of the anesthetic is more important than all the paraphernalia of the modern operating room or the burning of microbes. These are good when not overdone, but are not the most essential.

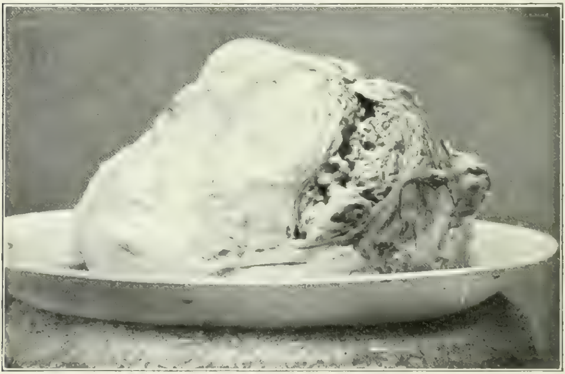

FIG. 1.—Mrs. W. Operated on July 17th, 1884. Recovered. Solid portion of tumor weighed 17 pounds.

The surgery should be limited to the removal of the condition which rendered it necessary. This excludes the exploration of the abdominal cavity with the hand and arm for the purpose of palpating the other organs. It goes without saying that it is the first duty of the surgeon to save the life of the patient; but it is a very close second to secure a quick aseptic recovery, so that postoperative adhesions and fistulæ may not render the last condition of the patient worse than the first. I believe it is far less harmful, and certainly more scientific, to cut down upon a suspected organ, than to more or less blindly manipulate the abdominal contents through a remote incision. This unsurgical technic interfers with prompt healing and thereby furnishes a culture medium for germs that increase post-operative complications and mortality.

During the first five years of my abdominal work I operated upon twenty-nine cases with seven deaths, a mortality of 25 per cent.; the second five years, upon two hundred and one cases with ten deaths, a mortality of less than 5 per cent; and during this second period there was a series of one hundred and forty-seven consecutive surgical recoveries. This rapid improvement seems incredible, but it is explained by the fact that I had learned some of the faults in technic and how to avoid and correct them. I had, also, a far better understanding of the pathology and course of the lesions when the second period began.

The greatest fault in the technic of the former period was the abuse of the drainage tube, which was so prevalent then, and for some time afterward. Three of the deaths in my first series resulted from incurable fistulæ which were made worse if not originated by the employment of this instrument. After I had learned this and how to treat, or rather, how not to treat a fecal fistula, the mortality from that source disappeared and has never returned.

In the fall of 1887 a bad tuboovarian abscess was draining into the rectum and the patient was going down hill. The late Dr. D. Hayes Agnew, who was in consultation, concurred that operation was necessary. After prolonged effort the abscess sac was separated from its deep and strong attachments, after which a glass drainage tube was placed. The patient was making a fine recovery until the fourth day, when the bowel contents began to flow through the drainage canal.

Various meddlesome things were done to stimulate deep healing, among them constant irrigation, but the fistula got worse instead of better. I then suggested to Dr. Agnew that closure might be effected by suture, after freshening the edges. He endorsed this with enthusiasm, and told Dr. J. William White of the proposed operation.

The next day, with the aid and counsel of these gentlemen, I worked for an hour, endeavoring to bring the sinus within reach, but failed; and the condition was worse than before. The patient lingered on with the false passage for three months and died from septic pneumonia.

Soon after this I blundered again, in a case of broad ligament cyst in which it was necessary to enucleate to make a pedicle. In doing this the bowel was denuded and I should have closed without drainage, but did not. Two days afterward fecal matter began pouring through the tube. I was so horrified and ashamed, having the case just related fresh in mind, that I got my brother, who was then a medical student, to come with one of his class-fellows, to aid me, and we quietly, four days after the operation, put the patient on the table and reopened the incision. I now learned something which gave me a clear understanding of the irritating effects and of the uselessness of the drainage tube. I found a large mass of lymph surrounding the tube and entirely shutting off the peritoneal cavity, so that it was draining only the bottom of the tract, where there was nothing to drain. Nature was endeavoring to get rid of the drainage tube, and had thrown this adventitious wall around it for that purpose. My object was, here again, to close the opening in the bowel, but I could not reach it. I then merely drew the abdominal incision together with adhesive straps, expecting the patient to die as a result of my unscientific treatment; but, thanks to the power of nature to heal, she recovered, and went home four weeks afterward, the fistula having closed.

I then, as an offering to nature for this invaluable lesson, and for the recovery of the patient, threw aside or destroyed my glass drianage tubes and have never used one since. I also established the dictum "When in doubt, *do not* drain," thus reversing the dictum of Gregg Smith. In the very few cases in which drainage has been necessary since I have used a soft rubber tube instead.

The lesson I learned about fecal fistula is this. Leave the case almost entirely to nature and the fistula will close.* Every case of rectal draining abscess I have had since that time was treated as in the following instance. A patient, aged twenty-eight years, became ill with tuboovarian peritonitis and abscess. The abscess had been opened by vaginal section. The patient improved and went about. She then had a second attack which was very much worse than the preceding. When I first saw her, ten weeks later, she was very ill. The entire pelvis was filled and the cervix was crowded up and forward, behind the pubic arch. The abscess had opened into the bowel two or three weeks previously, and had since been discharging pus freely by this channel. After abdominal section I removed the abscess sac. I did not look for the sinus through which the abscess had been draining into the rectum and I closed the incision without drainage. The patient recovered and did not have any further trouble.

The question of bowel injury from tumor pressure or the effect

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***Journal, Philadelphia Polyclinic,* 1890.

of the pathological process, or the direct wounding of the intestine from the manipulation necessary in separating adhesions, is of great interest and importance. There are doubtless occasions when repair of the bowel is necessary by suture or even by resection but that these occasions are rare I am convinced, for it is remarkable how quickly nature is able to restore what appears sometimes during an operation to be a very serious bowel lesion. In some cases I have found the bowel very dark and almost gangrenous in appearance, and even leaking a little, or at least in which a fecal odor was present, and yet in such cases I have always succeeded in finishing the operation without the necessity for these measures. I believe I have saved life in some instances of very badly suppurating cases, where the patient was very ill from sepsis and where the bowel was apparently leaking, by concluding the operation without any attempt at suturing, by simply placing a very soft rubber tube and probably removing it the next day, thus permitting the patient to recover, even with a fecal fistula, which soon closed. In a few extremely bad cases I have quickly concluded the operation without suturing the lower end of the incision, so that self-drainage might be encouraged if it should prove to be required. This not only saved time and irritation from the pressure of a foreign body, but it possibly also prevented the formation of a fecal fistula. It is opposed to the primary principles of enlightened surgery to interfere with repair by adjusting drainage measures where nature shows such prompt resentment by immediately surrounding the tube by an adventitious wall, thus indicating that she did not need our meddlesome services.

AFTER OPERATION HEMORRHAGE.

The series of consecutive recoveries was broken by the most appalling and heart-rending disaster that it has ever been my misfortune to suffer, a death from concealed hemorrhage caused by a shrinking pedicle and consequent slipping of the ligature! Who has not met with it? You who can answer in the negative, bow in humility and thankfulness for the good fortune for this great blessing.

The only satisfaction one has in the remembrance of such calamity is in the make-believe excuse of having saved others that would have perished if it had not been for prompt action when signs of bleeding presented; and for the response to the bloodless, pallid spirits that hover about the operation table, repeating this admonition while the pedicle is being tied: "Remember my fate. Oh, remember my fate!"

Danger from hemorrhage is always imminent. I believe that occult hemorrhage has been a more frequent cause of death following abdominal section than is generally known or admitted. The patient may not succumb immediately from the hemorrhage, but she may die a few days later from sepsis, due to inability to recuperate promptly, because of the loss of blood. I am speaking from my knowledge of the experience of others as well as from my own.

When pallor and a rapid pulse are observed a diagnosis of shock is usually made and the surgeon is anxious, but often does nothing more than to stimulate the patient and remain anxious for a few hours longer, hoping that she may rally; and if she does rally, his fears are quieted, further delay may result, and the golden moment may be lost.

I was long ago convinced that symptoms of shock meant hemorrhage, and I formulated the following dictum for my own guidance: "When in doubt, reopen." When there are symptoms of hemorrhage, the wound must be at once reopened.

The fault lies usually in the oversight and hurry of the operator. He may not have met with the accident in a hundred cases, or in a year, and a feeling of security results.

Once, in operating for the removal of an ovarian tumor, I found the appendix vermiformis diseased and removed it. Having an important engagement, I left the patient soon after the operation. Three hours later upon inquiry through the telephone, I was informed that she was in good condition, and I started to catch a train, but at last decided to visit the patient on the way. I believe that decision saved her life, for I recognized that she was not in good condition. Although the pulse was only 110, she was pale and a little dazed. Those in immediate attendance thought I was overanxious and that there was no cause for alarm. Fifteen minutes later her pulse was 130. I reopened the abdomen and found the pelvis full of dark, venous blood. The ovarian pedicle was secure. There was oozing from the mesoappendix, a condition I never had met. This is merely another instance, showing the necessity of always being on the alert to guard against hemorrhage. The patient might have recovered if I had not reopened the incision, but I doubt it. I do know that I have felt happy ever since that I made the visit and thus saved the patient's life.

Now, that which has been said about hemorrhage belongs to the period previous to thirteen years ago, for I have not met with this avoidable accident since that time, and the point in technic which has enabled me to say this is a very simple as well as a very effective device. After transfixing the broad ligament and tying as usual, the uncut ends of the ligature are given to the assistant holding the tumor, while a free ligature is made to encircle the pedicle groove. This is tied with a surgeon's knot only, and is left undisturbed until the pedicle is severed, when the ends are picked up and the knot tightened. It is surprising to find that, although the first tying had seemed secure, how much the pedicle had shrunken in the intervening time from the placing of the first ligature. The knot is then made secure by a reef or granny knot.

I had, of course, many times retied a suspected pedicle before dropping it, but the point I wish to emphasize is that during the past thirteen years I have treated *every* pedicle with suspicion and have retied every one, with the very happy result announced above.

(To be continued.)

RENAL CALCULUS IN RELATION TO THE KIDNEY AND URETER.*

BY
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THE most important phase of any lesion is the diagnosis, and the diagnosis of a calculus in the kidney or ureter is not always easy, and in the kidney not always possible without exploration. With the advent of the Röntgen ray, the improvement in the cystoscope, and the skill that has been acquired in the use of these mechanical appliances, we are able to make a correct diagnosis in a much larger percentage of cases than was true a few years ago.

When confronted with a renal lesion, we should not confine our investigation to any one method, but should include every known means, in order to arrive at a correct diagnosis. If this be not done, mistakes will occur frequently, and will occur more frequently if we neglect to make a bilateral investigation. Occasionally, the symptoms are on one side and the lesion on the opposite side. Broadly speaking, the investigation of a renal lesion, not especially of a calculus, but of all lesions in general, should embrace:

1. A careful history.
2. Physical examination.
3. A thorough study of the urine: quantity, specific gravity, chemical and microscopical examination.
4. Cystoscopic examination, and when indicated, catheterization

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*Read before the Philadelphia Obstetrical Society, April 3, 1913.

of the ureters, which enables us to make cultures directly from the kidney: to obtain specimens for comparative study; animal inoculations; to inject the kidney for pyelography, and to determine the functional activity of each organ. The functional activity of a kidney is lessened to a greater or less extent in almost every lesion of a kidney or ureter.

5. *X*-ray examination.

The history should be the first to receive attention. The most prominent symptom of renal calculus, the one which usually attracts the patient's attention and sends him to the physician, is pain.

The pain is on the right side in 65 per cent. of the cases, and on the left side in 35 per cent. of the cases (Guiteras). It is claimed that the kidney is enlarged in about one-third of the cases and when enlarged is nearly always tender. The ability to determine the size of a kidney will depend upon the amount of tenderness; the temperament of the patient; the condition of the tissues, whether relaxed or contracted; the amount of adipose tissue and the position of the patient at time of examination.

The pain is usually in the back and may radiate to the bladder or testicle, and varies from a dull ache to the excruciating, sharp, cutting pain of renal colic. It may be continuous, but generally follows exercise or jolting. Sometimes, however, it occurs at night. During an attack of renal colic there is facial pallor, cold sweats, flexed thighs and bending of the body. The pain is acute, paroxysmal, has its chief location in loin or in the side of the abdomen, and radiates along the ureter to the bladder, testicle, labia majora, or into the thigh. The excess of pain is frequently preceded by a chill and often accompanied or followed by nausea and vomiting. The paroxysm lasts from a few minutes to several hours, and as a rule, terminates more or less abruptly. During the attack the urine is passed frequently, usually contains microscopic and sometimes macroscopic blood, it may be clear, or turbid in case the kidney is infected.

The case in which the stone remains in the kidney or pelvis of the kidney or ureter, without giving rise to attacks of colic, are those which present the greatest difficulty in diagnosis. Reflex or referred pains are often met with in nephrolithiasis. In such cases the renal regions may or may not be free from pain. The pain may be along the course of the ureter, in the region of the bladder, ovary, uterus, or testicle, and sometimes in the gastrointestinal tract, where it may be described by the patient as an attack of indigestion.

Hematuria is another condition which causes the patient to consult the physician. The bleeding is aggravated by muscular exertion and prolonged standing, and lessened by rest in bed. It may be slight or prolonged. In one case which came under observation the bleeding at first was slight and intermittent, but later became active and continuous, and caused the patient to seek medical attention, at which time the hemoglobin was 40 per cent. As the hemorrhage could not be controlled, as the kidney had ceased to functionate and as the opposite organ was in normal condition, the patient was relieved promptly by a nephrectomy and a partial ureterectomy, with à rapid restoration to health. The specimen consisted of a sac filled with a bloody fluid and many flat, soft calculi; microscopic examination showed a tuberculous lesion.

In nephrolithiasis, the amount of urine and the specific gravity will vary with the amount of fluids ingested. The reaction is acid except in phosphatic calculi or advanced pyonephrosis. It may be clear, turbid, dark brown or red. Microscopic examination may reveal blood, pus, epithelial cells, tube casts and crystals.

After the history has been taken, the physical examination completed and the urine studied, a cystoscopic examination is made and the patency of the ureters determined.

If there be a stone in the bladder it will be readily detected. If the stone has passed recently, the ureteral orifice will usually be slightly red, swollen and edematous; in fact, it will have a characteristic appearance. It is usually impossible to pass a large size catheter by a stone in the ureter, without detecting its presence, but this may happen in a sacculated ureter. When we obtain a history of an attack of renal colic and find an obstruction in the ureter, we may presume that the obstruction is caused by a calculus, unless there is evidence that it is due to other conditions. When a catheter brings up against a stone in the ureter, the patient usually complains of pain and the measured distance from the ureteral orifice corresponds to the point of tenderness on the abdomen.

In the diagnosis of a stone in the kidney, the catheter is of little value. However, if the calculus be in the pelvis, and a wax-tipped catheter be used, we may find scratch marks in the wax. A wax-tipped catheter cannot be used with any degree of accuracy through the ordinary cystoscope, as its passage through the instrument may cause marks in the wax before it reaches the ureter. In the female it can be used with considerable satisfaction through the Kelly cystoscope.

When we have proceeded thus far in our investigation, the patient is referred to the Röntgenologist. The *x*-ray examination is the most important method we have to determine the presence of a renal calculus. Unfortunately, the *x*-ray examination cannot always be depended upon. At times the plates show a shadow when no stone is present, at other times no shadow is found when a calculus is present. A good illustration of the former is that of:

Mrs. H., æt. thirty; who complained of discomfort in the right side of the abdomen and occasionally of sharp shooting, pains along the course of the ureter. At times there were a few erythrocytes in the urine. Physical examination showed a moderately movable kidney, which I stated was the cause of the trouble. *X*-ray examination showed a shadow on the right side below the brim of the pelvis. On cystoscopic examination the bladder was found to be normal. A large ureteral catheter was passed to the kidney without meeting an obstruction. The patient consulted another surgeon, who opened the abdomen and found a calcified gland which had given the shadow on the *x*-ray plate. The symptoms persisted until the patient gained sufficient flesh to keep the movable right kidney in place.

When the *x*-ray shows a shadow along the course of the ureter, it is then important to determine if the shadow is due to a stone in the ureter or to some substance without the ureter. The way to determine this point is to have the *x*-ray examination made with a shadow-producing catheter in the ureter, as in the case of:

Mr. W. L., æt. twenty-four; who complained of some indefinite symptoms which suggested a lesion of the renal system. The röntgenologist found a shadow on the *x*-ray plate, which he thought was a calculus in the ureter. I was asked to catheterize the ureters with a shadow-producing catheter, in order that the ureters might be located. *X*-ray examination with the catheters in place showed the shadow to be well to the inner side of the ureter.

Pyelography I have found of no value in the diagnosis of stone in the pelvis of the kidney or ureter, except to define these structures.

When a patient complains of symptoms suggestive of a renal calculus, it is our duty to determine whether or not a stone is present. An attack of renal colic usually indicates the presence of a stone, but this is not always the case. Any condition which interferes with free drainage from the kidney through the ureter may cause an attack of colic. I have seen attacks of renal colic in a patient with a pyelitis, as in the case of:

Miss O., æt. thirty; who complained of discomfort and at times attacks of severe pain in the right side of the abdomen and of frequent micturition. The urine contained pus and a few erythrocytes. Cystoscopic examination showed a mild cystitis, with some redness about the right ureteral orifice. Catheterization of the ureters and *x*-ray examination were negative as regards calculus and no stone was passed. Cultures from the right kidney showed infection by the colon bacillus. Renal colic may also occur in early hydronephrosis (Hugh Cabot, *Jour. A. M. A.*, Jan. 4, 1913, p. 16–20).

If a patient has had an attack of renal colic and has passed a calculus or one is found in the bladder, we should determine if there are other stones. When a stone is passed after an attack of renal colic, I have never been able to appreciate the line of reasoning which would justify the exposure of a kidney by a surgical operation to search for other calculi. I have seen a few patients upon whom this was done, and the stones, which were supposed to be present, were not found.

In patients with obscure abdominal or pelvic symptoms, we must remember the areas of reflex or referred pain of renal calculus. The most frequent lesion with which a renal calculus is likely to be confounded on the right side is an attack of appendicitis.

Many patients have been subjected to operation for appendicitis when the symptoms were due to a renal calculus. I have seen several of these cases and the symptoms disappeared promptly after the stone had been passed, as in the case of:

Miss M., æt. twenty-three; who complained of pain and soreness in the right side of the abdomen, especially in the region of the iliac fossa. She consulted a surgeon who removed the vermiform appendix with no amelioration of the symptoms. Cystoscopic examination showed the right ureteral orifice to be somewhat red, swollen and edematous, and a small calculus in the bladder, which had evidently come from the right side a short time prior to the examination. The sumptoms disappeared after the calculi had been passed.

Another case was that of Mrs. B., æt. twenty-four; who complained of tenderness and, at times, of pain in the right side of the abdomen. She had had the vermiform appendix removed with no relief of the symptoms. Cystoscopic examination showed the bladder to be in normal condition. A ureteral catheter was passed to the left kidney. On the right side the catheter met with an obstruction about 10 centimeters above the bladder. When the point of the obstruction was tapped, the patient flinched and stated that that was the painful spot. *X*-ray examination showed no shadow. The calculus was passed a few hours later, and the symptoms disappeared.

When there is a question whether the symptoms are due to an inflamed appendix or to a renal calculus, some surgeons recommend that an *x*-ray examination be taken, and if no stone be found, that the appendix be removed. While this, of course, is much better than to subject all patients with such symptoms to an operation for appendicitis, nevertheless, mistakes will occur if the investigation be concluded with the *x*-ray examination. The *x*-ray will not show every calculus, and, on the other hand, a calcified gland or some extraneous substance may give a shadow when no stone is present, and an attack of appendicitis may advance to a dangerous or even fatal stage, because the diagnosis of a calculus in the ureter is made from a shadow on the *x*-ray plate. When the diagnosis is doubtful, an *x*-ray examination and a catheterization of the ureter should both be made, and if necessary the *x*-ray examination should be made when a shadow-producing catheter is in the ureter. When the lesions coexist, as in one case which came under observation, the proper course to pursue is even more difficult to determine. The following case is a good example.

Mrs. L., æt. thirty-four, while waiting to recover from an attack of bronchitis before having the vermiform appendix removed, was suddenly seized during the night with pain in the right side of the abdomen, followed by nausea and vomiting: a temperature of 101° F. and an acceleration of the pulse rate. The urine contained leukocytes and erythrocytes. As the patient was corpulent, it was not possible from the physical examination to determine whether the condition was an acute exacerbation of a chronic appendicitis, or an attack of renal colic. Cystoscopic examination showed a mild cystitis. A ureteral catheter was passed to the kidney on the left side. On the right side the catheter met with an obstruction about 3 centimeters above the bladder. *X*-ray examination showed a shadow on the right side. Within forty-eight hours the calculus, after being tapped gently with the catheter, passed into the bladder, and the acute symptoms subsided. After the patient had recovered from the bronchitis, a plastic operation was done of the cervix uteri and on the perineum; the abdomen was opened, a right oophorrhaphy and a shortening of the round ligaments was performed, and a chronically inflamed vermiform appendix was removed. Had it not been for the *x*-ray, the cystoscope, and the ureteral catheter, the patient would have been subjected to an operation for acute appendicitis, and at a later date it would have been necessary to undergo another operation for the cure of the other lesions.

What unnecessary surgery may be done under a mistaken diagnosis, due to lack of a careful investigation, when the symptoms are on the left side, the following case illustrates:

Mrs. S., æt. thirty-eight; who complained of pain and discomfort in the left side of the abdomen. The left kidney had been explored, and as no calculus had been found, the abdomen had been opened and an abnormal loop in the sigmoid had been sidetracked by a lateral anastomosis. When the patient came under observation, a careful history was taken, and on physical examination a point of tenderness was found in the left lower quadrant of the abdomen. Cystoscopic examination showed granular patches in the bladder. A ureteral catheter was passed to the right kidney. On the left side the catheter met with an obstruction 10 centimeters above the bladder. When this point was reached the patient stated "that is the painful area." The stone was tapped gently with the catheter and subsequently was passed into the bladder, and the attacks of pain in the left side ceased. After the cystitis was cured, all the symptoms disappeared.

At times it is necessary to make a differential diagnosis between a renal calculus and a tuberculosis of the renal system, which, when the genital system is not involved, is always primary in the kidney; attacks of renal colic due to causes other than to a calculus; tumors of the kidney; attacks of Dietls' crisis; the crises of locomotor ataxia; cholelithiasis, and diseases of the gastrointestinal tract including intestinal stasis. With a careful history and a thorough investigation, a correct diagnosis can usually be made.

When a diagnosis is made of a calculus in the kidney, there is but one treatment, and that is, removal of the stone as promptly as possible, providing the condition of the patient will permit of a surgical operation. Neglect to remove a renal calculus not infrequently is followed by the destruction of a kidney as in the case of:

Mr. J. W., æt. thirty-four. During July of 1912, he had had three attacks of renal colic on the right side. When I saw him on July 18, after the third attack, he had had a chill, followed by a temperature of 105° F. Two years prior to this attack, in one of our large college hospitals, a vesical calculus had been removed by a suprapubic cystostomy. The night following the day of operation, he had an attack of renal colic, and a second attack the next day. He was discharged from the hospital after the suprapubic wound had closed. From then until he came under observation, he had had several attacks of renal colic. Careful investigation demonstrated that the right kidney had ceased to functionate, and that the left kidney was doing the work of two normal organs. *x*-ray examination showed two rather large calculi in the right kidney.

Occasionally a tuberculosis is engrafted on a kidney which contains a calculus, or a malignant condition may develop.

In many cases a stone in the ureter will be passed, in a few hours or days, after it has been tapped gently by a catheter. In case a ureter becomes obstructed by a calculus and it does not pass within twenty-four to forty-eight hours after the ureter has been injected with sterile oil, the sooner the stone is removed the better. It is claimed a kidney will recover its function if the ureter be not obstructed longer than ten days (Barney, J. D., *Surgery, Gynecology and Obstetrics*, vol. xv, No. 3, pp. 290–295, Sept., 1912), but it is not wise to go the limit before instituting surgical intervention.

Before undertaking an operation for nephrolithiasis, it is the duty of the surgeon to determine whether or not there is a kidney on the opposite side, the condition of the organ, and its functional activity. He must also know the condition of the involved organ. He who does surgery on a kidney or ureter without this knowledge is not giving a patient the chance for recovery to which he is entitled.

1527 Spruce Street.

OVARIAN TERATOMATA.*

BY

CHARLES STANLEY WHITE, M. D.,
Washington D. C.

(With Two Illustrations.)

That the ovary should be the site of a great variety of pathological conditions is not strange when the physiological and anatomical activity is considered. It is said that no other organ is so often the situation of a new-growth and this growth may be from either the stroma or parenchyma. It is the growths from the ovum that we wish to consider more particularly, usually called dermoids and teratomata or collectively embryomata, but pathologists differ widely in the classification, and the subject is difficult to approach without adding confusion to the confused.

A teratoma has been defined as a tumor, the characteristic feature of which is that it is composed of cells or tissues that normally do not occur in the affected part, or at least are not present at the period of bodily development at which the growth manifests itself. It would seem that any growth containing ectodermic, mesodermic or entodermic cells, is some form of a teratoma. That statement appears simple. To illustrate the chaotic state of the classification, it is variously stated that a dermoid is one in which the three primary embryonic layers are represented and that a teratoma is similar to the dermoid in that it has representatives of the three embryonic layers. McConnell states that the term is restricted to those in which certain portions, such as a rudimentary gland or limb, is more completely developed. Hektoen believes that a teratoma is an atypical modification of the dermoid, bearing the relation to the latter similar to that of carcinoma to the cystadenoma, and that there is a further difference, namely, that the dermoid is chiefly cystic, the teratoma is a solid tumor. Adami, under the caption. "Ovarian Teratomas" describes two forms. (1) The large cystic teratoma or ovarian dermoid, and (2) the solid or small cystic teratoma, or the uncommon type. Nichols and Adami object in these terms to the unscientific classification. "It should be remarked however, that the term 'dermoid' which has had such extensive vogue, in the light of recent researches has lost much of its significance, if, indeed, it is now not actually misleading. It is commonly held, for example, that the dermoids are cysts composed of more or less modified skin with other structures of epidermal origin. Careful study has shown, however, that even the simplest of them contain structures from other than the primitive germ layers. Consequently the distinction between 'dermoid and teratoma' is an artificial one and had better be discontinued. It is simpler and more correct to class all the growths of this kind under the one generic term, 'teratoma.' If the word 'dermoid' be retained at all, it should be employed simply for convenience of description." What appears to the writer as the most rational division is based on microscopic findings and it must be conceded that the microscope is more exact than any clinical methods. We recognize four groups of teratomata:

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* Read before the Washington Obstetrical and Gynecological Society, January 10, 1913.

(1) Epidermoid cysts, in which the only primitive germ layer represented is from the ectoderm, and represented by a layer of stratified epithelium and connective tissue, simulating in a general way, a layer of skin. The cavity contains saponified débris. The surface is fissured and scaly and of a pearly appearance.

(2) Pure dermoid cysts are the most frequent type and here more of the true likeness to epithelium or skin is seen. Small papillas, hair follicles, and sebaceous glands are usually seen, and not infrequently hair in tufts. During life the cavity is filled with a yellowish and granular fat, besides the epithelium scales.

(3) Compound dermoids, or simple teratomas are similar to the preceding class with the addition of bone and teeth. The bone bears a likeness to the inferior maxilla in some instances, while the teeth similate the temporary and permanent set.

(4) Compound teratomas are much rarer. In addition to the epithelium, hair, bone, teeth and cartilage, other structures are found which indicate an origin in the mesoderm and entoderm. Tissue which closely resembles mucous membranes, salivary glands, smooth muscle fibers, brain substance, rudimentary eyes, even limbs have been noted. It is stated by some that these tumors are almost solid and are of a malignant type.

In the absence of facts we must turn to theory for the etiology of teratomas and the greatest help has been derived from the study of monsters or teratology. Embryologists term totipotent cells those that are capable of producing every variety of cells in the body, and the following are recognized:

I. The primordial blastomeres.
II. The primitive germinal area cells.
III. The growing point cells of the germinal area.
IV. The germinal blastomeres.
V. The mature ovum and spermatozoa after fertilization.

Two general theories have been propounded for the development of monsters—first, the fusion of separate embryos and second, the cleavage or dichotomy, but neither explain satisfactorily all the deviations from normal growth. Adami substitutes or adds a growing point theory, based on plant pathology. It is known that most plants have a center at either apex, that the cells furnish daughter cells and by the growth and multiplication, the centers become separated, in reality grow backward, so that a tree really does not grow taller from below but grows from either end. New growing points are developed laterally and continue to grow until an *anlage* or matrix is developed. The *anlage* is a center from which growth occurs in an orderly manner, resulting in the formation of organs. The growing points cease their activity at this period, but should they continue, monstrosities occur. Applied to teratoma, we may believe that a growing point continues. We should then be prepared to note that most teratomas occur near the median line, and such is the case. It fails to explain entirely their presence in the ovary.

The inclusion theory of Cohnheim seems hardly tenable, maintaining as it does that all germinal layers have been isolated and inhibited temporarily. The bilateral nature of ovarian teratomas is a strong argument against this. Marchand believes that they are the products of fertilized polar bodies or oocytes, but as Wilms has found as many as five embryomas in one ovary while but three polar bodies are cast off, this theory can be discarded. Are they the result of parthenogenesis by a process of the mature germ cell, ovum or spermatozoan, under some unexplained condition, growing and segmenting without throwing off polar bodies and without fertilization? In some lower forms of life parthenogenesis is common, but in man its existence remains to be proven. In eggs from a virgin chick, there seems to be a tendency toward growth, but it is abortive. That they are due to aberrent growth of the cells of the internal theca of the Graffian follicle, is a statement without support. Do they spring from displaced blastomeres or the first daughter cells? This dislocation or implantation of cells capable of producing all tissues of the body, the so-called totipotent cells, is popular at present, and has many advocates. These cells have been transplanted to the future *anlage* of the ovary and take on great activity, to eventuate in teratomas. Bonnet, who deserves credit for this theory, based it largely upon biologic experiments in lower animals and has shown by shaking an ovum that such a dislocated cell can develop into a complete individual. As stated previously, Wilms has found five separate centers of growth in one ovary, and that alone detracts from the plausibility of Bonnet's theory.

Finally, the modified parthenogenetic or germ-cell theory must be given due weight and rightly so. It is believed that the growing points do not develop from ova or spermatozoa matured for fertilization but from forerunners of these cells, the oocytes or the spermatocytes.

CASE I.—Margaret C., age four years.

Family History.—Father and mother both healthy. Of nine brothers and sisters, three died in infancy, one brother at age of ten appears to be recovering from tuberculous peritonitis, another brother at fifteen years has recovered from tuberculous cervical adenitis. The maternal grandfather, has supernumerary digits on both hands and the maternal great grandfather had a similar deformity.

Previous History.—Only illness she ever suffered was mild gastroenteritis in the summer of 1911.

Present Illness.—On July 8, the mother of the patient noticed a lump in the hypogasteric region. Examination by Dr. Truman Parker, showed a freely movable mass in the abdomen about the size of a lemon, which was painless and could be shifted into the right or left hypochondrum or into the right or left iliac fossa. The temperature and pulse was normal and constipation and anorexia were the chief complaints. Calomel and santonin were ordered and the child seen on the third day when the condition was found unchanged except constipation was more marked after a good movement from the calomel. A high enema was ordered, and the patient was visited again on the sixth day. The bowels had not moved since the previous visit, the temperature was 100, and the pulse was slightly accelerated. The abdomen was distended and the child languid. The patient was brought to the Emergency Hospital where the author examined it July 15. At this time the abdomen was distended, the bladder was globular from distention with urine, but no mass could be felt. An enema was succeeded by a copious movement and about 6 ounces of urine withdrawn by catheter, after which under a general anesthetic, a tumor about the size of a base ball, was felt in the left iliac region, quite movable and smooth.

An incision was made in the middle line and a globular tumor, with a twisted pedicle extending from the right corner of the uterus presented. It was removed by clamp and ligature. The convalescence was prompt and satisfactory.

A section of the growth showed the following, as described by Dr. Le Compte:

SPECIMEN NO. 1528.

Compound Teratoma of the Ovary.—The specimen consists of a single mass measuring 7.5 centimeters in its longest and 6.0 centimeters in its shortest diameter. The surface is smooth except at the point where the pedicle was attached. Ecchymoses are present on the surface at one pole of the tumor. Longitudinal section shows it to be composed of cysts of varying size and of interstitial tissue about equally divided in amount. At about the center a small spicule of bone protrudes from the cut surface and near the periphery a small tuft of black hair is seen. Microscopic examination of the cyst wall shows that one is lined by mucous membrane of an intestinal type which changes abruptly into a stratified squamous variety; another has a lining of epidermis with hair

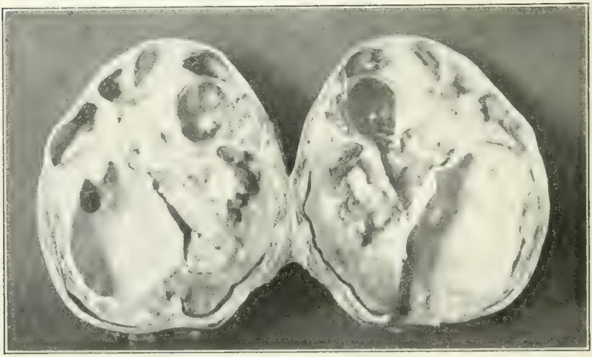

FIG. 1.—Longitudinal section of the tumor opened to show the almost equal division of solid and cystic contents. $\frac{1}{2}$ size.

follicles, and sweat and sebaceous glands beneath it, although no hair is visible in the cavity of the cyst while another is lined by a single layer of flat epithelial cells.

The contents of the cysts vary from a clear fluid which escapes when the cavity is opened to an almost solid mass of cellular debris.

The interstitial tissue consists for the most part of fibrous tissue. Imbedded in it is bone, glandular tissue resembling the kidney and a moderate amount of irregularly distributed smooth muscle tissue.

The complicated structure, presenting tissues derived from all three of the primitive germ layers warrants the classification of this mass as a teratoma, while the almost equal division of solid and cystic elements and the presence of intestinal mucous membrane and rudimentary glandular tissue, place it in the class designated by Adami as compound.

Case II.—Mrs. D., age thirty-two. The mother of three children, the youngest of which is six months. Two are living and healthy. The family history is negative.

Previous History.—Her first child was a monster, from her description, and lived but four days. She had no illness other than the present one.

The present illness she dates from Sept. 17, 1912 or about two months after the birth of the last child, and began with pains in the back and lower abdomen, lasting about two days. She has chilly sensations and fever for two subsequent weeks and went to a hospital for treatment, but repeated examinations, including blood examinations for typhoid and malaria were negative, though few pus cells were found in the urine. She improved somewhat and returned home, only to have a recurrence of the fever with definite chills and irregular fever. For two weeks the temperature ranged from 99 to 103, but the patient suffered only from slight pain in the abdomen and went to bed only at the earnest solicitation of her physician. With Dr. Norcross, the author saw the patient Oct. 23, but the examination was fruitless. A blood culture was taken, but no growth resulted. She was admitted to the hospital Oct. 24, 1912, and operated upon the following day. The left ovary was large, soft, darkly discolored and was removed. The left tube had been completely divided about 1/2 inch from the corner, presumably by a band of adhesions, and both distal and proximal ends were round, smooth and completely sealed. The right ovary was cystic and together with the appendix seemed pathologic. Her convalescence was marked by more than the usual discomfort and an irregular temperature which reached its highest, 102, on the eleventh day, but which subsequently became normal. She has been doing well since with the exception of occassional attacks of indigestion and frequent attacks of neuritis in one leg.

A section showed the following:

SPECIMEN NO. 1651.

Cystic Ovaries.—The specimen consists of two soft masses joined together by an adhesive band.

The larger of the two masses is about 6 centimeters long by 4 wide and 3 thick, and has for the greater part a smooth surface. Curling around it is a strip of tissue terminating at one end in a funnel-shaped depression with dentate margins and at the other in a rounded stump. Microscopic examination showed typical structure of the Fallopian tube.

On longitudinal section, the mass appears as a cyst with a single cavity containing a yellow fatty material in which is imbedded black hair both free and attached to the wall of the cyst. Microscopically the wall consists of degenerated fibrous tissue covered externally by a slightly inflamed peritoneum. The lining membrane of the cyst is partly of simple and partly of stratified squamous epithelium. No hair follicles or sweat or sebaceous glands are present in the sections made but their presence may be assumed on account of the hair attached to the wall of the cyst and visible microscopically. Microscopically, the cystic contents is composed of an amorphous substance with a few large cells scattered through it.

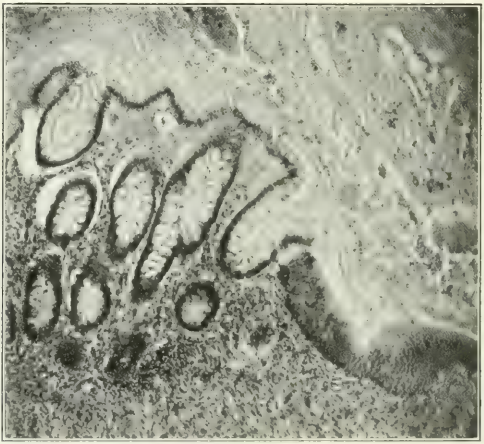

FIG. 2.—Photomicrograph of part of the tumor at ×. Shows junction of columnar epithelium of intestinal type with stratified squamous epithelium.

From the examination made which demonstrated the presence of hair and fibrous tissue but no formed structures derived from the entoderm, the conclusion that the mass is a pure dermoid cyst seems proper. Since the sections did not pass through the head area, it cannot be stated with certainty whether more complicated structures whose presence would place the cyst in the class of compound dermoids or teratomata, are present or not.

The entire subject is one of intense interest and deserves much more consideration from the pathologist and gynecologist. A closer study clinically and microscopically is in order and this paper is a plea for such cooperation. We have a plethora of theory and an anemia of facts. It has been truly said that it is not that we are so ignorant, but we know so much that is not so.

911 SIXTEENTH STREET.

LEUKOPLAKIA UTERI.*

REPORT OF CASE AND EXHIBITION OF SPECIMEN.

BY
THOMPSON T. SWEENEY, M. D.,
New York.

(With Four Illustrations.)

LEUKOPLAKIA or leukokeratosis is a rare disease affecting certain mucous membranes, the clinical manifestation of which is the appearance upon the membrane of slightly raised plaques, whitish or psoriatic in character, produced by a marked hyperplasia of the epithelial layer.

The mucous membranes of the mouth and tongue are the most common sites of the disease. Not until the appearance of the paper of Robert Weir (*N. Y. Medical Journal*, 1875) entitled "Ichthyosis of the Tongue and Vulva," were the female genitalia known to be affected by this disease.

With few exceptions, Enlgish gynecologists make no mention of leukoplakia as a gynecological ailment.

To the researches of Letulle, Pichevin, Pettit, Jayle and Bender we are indebted for what information we have of this disease affecting the vulva and vagina.

Leukoplakia of the uterus is very rare and little was known about it, until Jayle and Bender published their paper in 1905 (*Revue de Gyn. and Chir. Abdominale*) giving a complete description of the disease based upon the study of two personal cases and a careful review of the literature. The cases of uterine leukoplakia reported were divided into those in which the cervix was affected and into those in which the mucous membrane of the uterus was the seat of the disease.

Leukoplakia of the cervix occurs in the same manner as that of the vulva, both being covered with squamous epithelium and subject to the same irritants or traumatic influences. But the explanation of the occurrence of the disease on the mucous membrane of the cervical canal and body of the uterus is not so easy. Here we have columnar epithelium and a simple hyperplasia of these cells cannot produce leukoplakia. It can only be explained by admitting a metaplasia of epithelium, in other words, a substitution of squamous for the columnar variety. This is the contention of Jayle and Bender, and is substantiated by two factors—first, primary stratified epithelioma of the body of the uterus; second, the presence of squamous epithelium in specimen curetings done for metritis.

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*Read before the Section on Obstetrics and Gynecology of the New York Academy of Medicine, March 27, 1913.

The work of Klob, Heitzman and Zeller supports this statement. Zeller reports that in sixty-three cases curetted for metritis the curetings showed squamous epithelium.

Madame L. Rubinovitch reports several cases of primary epithelioma of the body of the uterus and Jayle and Bender report a case of leukoplakia of vaginal vault with cancer of the cervix, leukoplakia of the cervical canal not destroyed by the cancer and leukoplakia of part of the mucous membrane of the body. There seems to be no doubt that there are cases of true metaplasia of epithelium, whether this be from the extension of the cervical epithelium as claimed by Jayle and Bender, or whether due to inflammation (which seems to play a prominent part in this disease) or in part to a cauterization treatment as suggested by Piersing.

One fact must be pointed out. The presence of squamous epithelium inside the uterus is not synonymous with leukoplakia. This is only present when epidermization takes place under the influence of some irritant cause and when the superficial layers become keratinous and a stratum of eleidine cells are produced.

Etiology.—The etiology of this disease is very obscure. It occurs most frequently between the ages of forty and forty-five, but has been found in a woman of thirty. In the writer's case the patient was thirty-five years old. Diabetes, arthritis and syphilis have been designated as causal factors. Landau and Gougher believe syphilis to be the sole cause. Berkley and Bonney of London accept the view of Jayle that insufficiency of the ovaries plays an important rôle in the etiology.

Robt. Ivy (*N. Y. Medical Journal*, April, 1912) states that he could exclude syphilis in a number of cases of buccal leukoplakia. The author's case was infected with syphilis and had also lost one ovary.

While each of the diseases mentioned above have been present in cases of leukoplakia, the writer believes them to have been merely coincidental, and to be of little etiological importance.

Diagnosis.—The diagnosis is easy. The disease is characterized by the formation of one or more whitish plaques of irregular outline which often coalesce into patches. There plaques are always adherent and irrigation or swabbing will not detach them. When forcibly removed, they leave a freely bleeding surface. They vary in color, the more recent ones resemble slight cauterizations by nitrate of silver; are transparent and not elevated from the mucous membrane. The older plaques become quite thickened, are a dirty or yellowish white, and may be considerably raised above the surrounding healthy tissue. When present on the vulva, the patient may complain of burning and itching sensations. Vulval leukoplakia seldom invades the vagina and must be distinguished from kraurosis.

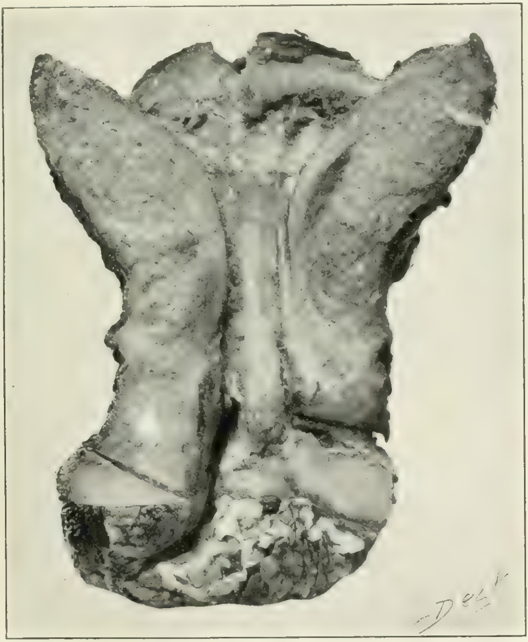

FIG. 1.—Leucoplakia of cervix. Photograph of uterus cut open longitudinally, showing the thickened opake epithelial lining of the cervix with bleeding points scattered over it.

Jayle and Bender lay great stress on the distinction to be made between a true and false leukoplakia.

In cases of simple chronic metritis, plaques are sometimes found which might easily be mistaken for true leukoplakia. These can easily be wiped off and microscopically show a fibrinous coagulum in the meshes of which are found leukocytes and detached epithelium.

In cases of leukoplakia of the cervix, the patient has more or less serosanguineous discharge, but pain or hemorrhage are always symptoms of a complicating disease, such as cancer and adnexitis. Leukoplakia of the body of the uterus gives no symptoms and is recognized only by cureting or after hysterectomy.

Pathology.—The clinical diagnosis must always be borne out by the pathological findings. According to Jayle and Bender, the pathological anatomy of leukoplakia is the same wherever found. There is a general thickening of the epithelial layer, a marked hypertrophy of the horny layer, a hypertrophy of the stratum granulosum with an increase of eleidine cells and an increased interpappillar formation.

Prognosis.—The course of the disease is slow and progressive, yielding very little to any treatment. Verdalle followed one case for three years without finding any improvement under all forms of treatment.

Considering the slow progress of the disease and the absence of distressing symptoms, we might consider leukoplakia a benign disease were it not for the danger of cancerous degeneration. Jayle and Bender had fourteen cases complicated by cancer. Berkley and Bonney believe it to be the first stage of malignancy. The three cases reported by Verdalle died of cancer of the cervix.

Robt. Ivy's two cases of buccal leukoplakia showed unmistakable evidence of epitheliomatous developement.

Fournier claims that cancer develops in 30 per cent. of buccal leukoplakia.

With our limited statistics it is difficult to form conclusions as to general prognosis, but the ever present possibility of cancerous development must make it doubtful.

Leukoplakia of the cervix is extremely rare. Pozzi states that it has not been observed in more than five instances. The writer believes his case to be the first reported in this country and has collected eight other cases from the literature which chronologically are as follows: One case reported by Hottman de Villiers and Therese; three cases of Verdalle; one case of Jayle and Bender;

one case of Jayle and Letulle; two unpublished cases of Jayle and Bender, reported by Madame L. Rubinovitch.

In the previous history of all these cases there was nothing much of interest save all were affected by an old metritis. Verdalle points to probable syphilis in the first of his cases. In all the other cases syphilis was positively excluded.

None of the eight cases seem to have had so great an area involved as the case reported by the writer, in which the disease covered the entire cervix and extended into the vagina on one side and up into the cervical canal.

In the case of Hottman de Villiers and Therese, the cervix was enlarged and the lips ulcerated and on the posterior lip near the erosion was a white plaque the size of a penny. It projected slightly from the surrounding tissue and was intimately adherent to the area of implantation.

In the first case of Verdalle two plaques were present on the anterior lip of the cervix. They were smooth and showed no distinctive elevation. In his other cases the plaques were found on the posterior lip.

In the case of Jayle and Bender many polypi projected from the cervical canal and a large whitish plaque, rugous to the touch was situated on the polypus nearest the anterior lip (metaplasia of epithelium).

In the case of Jayle and Letulle, a characteristic plaque the size of a lentil appeared on the posterior cervical lip.

In Jayle's case reported by Rubinovitch, there was leukoplakia and kraurosis of the vulva and vagina and one single plaque, on the posterior lip of the cervix.

In the last case reported by her, there was a cancer on the cervix with vaginal invasion. The cervix showed a whitish appearance.

Report of Case.—Mrs. C. W. appeared at the Post Graduate Hospital Clinic, June 14, 1910; age thirty-three years; born in Canada. Family history good. Usual diseases of childhood. First menses at sixteen years, regular every twenty-eight days, flow three days, no dysmenorrhea. Married ten years, no children. One suspected abortion shortly after marriage, curetage eight years ago. Contracted syphilis three years previous. Suffers with profuse yellowish discharge with unpleasant odor. Backache, pain in both iliac regions. Frequent micturition. Reflex nervous symptoms and gastric disturbances.

Diagnosis.—Acute gonorrhea. Patient was given local treatment and when somewhat improved discontinued her visits. She returned to the Clinic the last of March, 1912, suffering great pain in lower abdomen. Diagnosis of pyosalpinx was made and the patient operated upon April 5. Curetage, appendectomy, right salpingo-oophorectomy, left salpingectomy, and suspension of uterus. Patient left the hospital in good condition.

She appeared again at the Clinic in the latter part of May when the leukoplakia of the cervix was first discovered, the uterus and cervix enlarged. The plaques were first observed on the posterior lip but rapidly spread over the whole cervix, in spite of every effort to control the disease. There was continuous serosanguineous discharge which caused the patient much mental depression. The cervix bled freely at the slightest friction. The insertion of the bivalve speculum would cause free oozing.

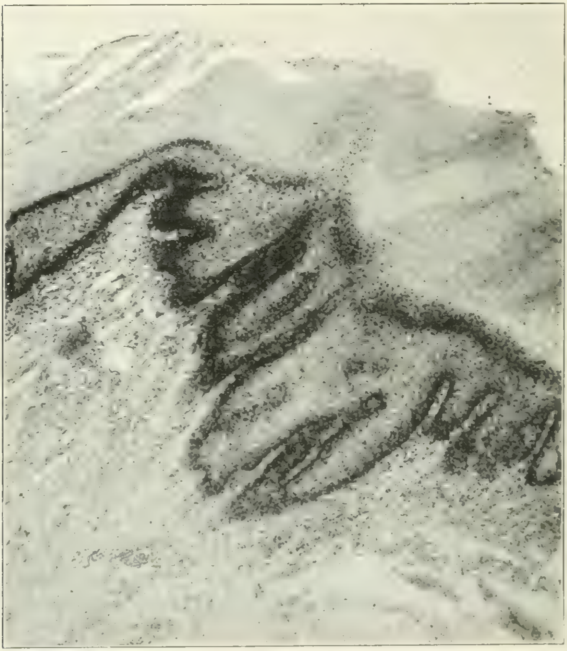

FIG 2.—Section through cervix showing marked hyperkeratosis of epithelium.

A Wassermann examination was made in August, the report of which was positive. On August 27, Salvarsan was injected intravenously, but no real improvement in her condition resulted.

Another Wassermann was done November 25, and reported very faintly positive. The patient was operated upon by the writer December 19, 1912. A complete hysterectomy with vaginal cuff was performed by the abdominal route. The left ovary, which appeared normal and functionating, was not removed. The patient made an uneventful recovery, leaving the hospital in January.

PATHOLOGICAL REPORT.

Gross Description.—The specimen submitted for examination consists of a moderately enlarged uterus without the appendages; it measures 9 cm. in length, 5.5 cm. in breadth and 3.5 cm. in thickness. The peritoneal covering is smooth, dry and pale pink in color. The cut ends of the uterine arteries where they enter the uterus appear normal. A narrow strip of tissue (about 0.5 cm. in diameter) resembling vaginal wall is seen attached to and encircling the cervix 2.5 cm above the external os uteri.

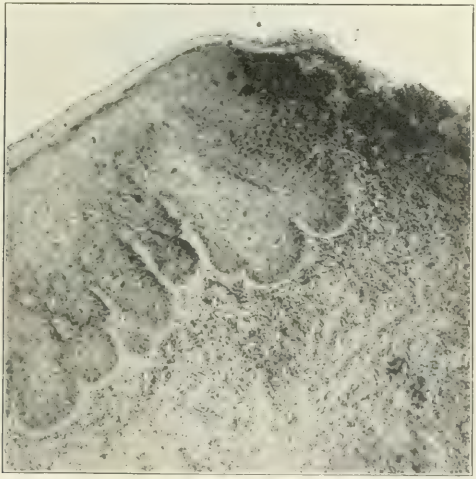

FIG. 3.—Section through cervix showing hypertrophy of epithelium with moderate hyperkratosis; also extensive small round cell infiltration of the subepithelial tissue.

The most striking feature in connection with the specimen is the appearance of the cervix, which is slightly larger than normal and is covered externally by a bluish-gray membranous layer, not readily detached; when an attempt is made to strip it off a raw injected surface is exposed beneath. This layer is moderately wrinkled and in addition has a few excoriated areas, 2 to 3 mm. in diameter scattered over it. The accompanying piece of vaginal wall is also involved in the same process by extension from the cervix. The external os has the appearance of a transverse cleft, and is 1.5 cm. wide. On cutting the uterus open anteriorly, a narrow, pointed prolongation of the opaque covering is seen extending over the posterior lip into the cervical canal for a distance of 1 cm. The cavity of the uterus is found to be proportionate in size to that of the entire organ and measures 6 cm. in length. The endometrium is soft, evenly distributed and reddish-gray in color; it is not abundant and is easily scraped away. The cut surface of the uterine wall presents nothing worthy of note; it is 1.6 cm. in thickness through the fundus and 2 cm. through the midportion of the body. Three small globular intramural fibroids, 0.5 to 1 cm. in diameter are seen, one in the fundus, one in the anterior wall and the remaining one in the posterior wall.

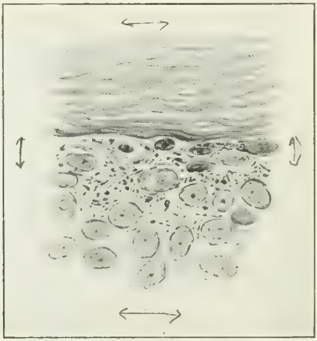

FIG. 4.—Drawing of section through cervix showing keratohyaline granules in cells below the cornified layer.

Microscopic Description.—Sections taken from the cervix and vaginal wall show hypertrophy of the superficial layer of cells or stratum corneum; this hypertrophy is especially marked over the cervix where it presents a structureless appearance, and is similar to the condition of hyperkeratosis noticed in thickened skin, such as is frequently found on the palm of the hand and other portions of the body. The keratinized layer of the vaginal epithelium is well defined but is not as thick as that observed on the cervix, where this layer measures 1 mm. in thickness at some points. Beneath the horny covering is seen a thin layer of flattened or oval cells containing both coarse and fine granules (keratohyaline granules); the nuclei of these cells are for the most part small and stain deeply. The cells of lowermost strata of the epithelium are swollen, causing the interpapillary digitations to appear prominent and also irregular in shape and size. Occasional areas, denuded of epithelium, are observed in sections from the cervix, exposing the underlying tissue which appears very much congested and is infiltrated with large numbers of lymphoid and plasma cells and moderate numbers of polymorphonuclear leukocytes. This cellular infiltration is very extensive in the region of the external os uteri and forms quite a wide zone immediately beneath the epithelium. It is less marked in the wall of the vagina. The mucosa of the cervix shows a mild degree of glandular dilatation and hyperplasia; these glands contain desquamated epithelial cells, leukocytes, red cells and mucus. Occasional foci of perivascular lymphocytic infiltration are also observed.

No evidence of malignant proliferation of the cervical epithelium can be discovered in many sections examined. Tissue stained by Levaditi's silver method is negative for spirochetes.

O. S. Hillman.

The above examination indicates a condition of marked chronic inflammation of the cervix involving particularly the subepithelial tissue; associated with this reaction are the epithelial changes of hyperkeratosis, giving rise to the clinical observation of leukoplakia and the increase in keratohyaline granules of the stratum granulosum. No clue can be obtained as to the etiology of the process from this investigation.

Treatment.—The question of treatment of leukoplakia uteri is of great importance. Given the tendency to degenerate into cancer, early surgical interference is indicated and it would be unwise to wait until malignancy supervenes.

There should be no hesitancy when we compare the relative innocence of the operation to the danger to the patient incurred in the delay. An amputation of the cervix will often suffice. But when serosanguineous discharge or hemorrhage cause us to suspect cancer, hysterectomy is perferable.

40 East Forty-first Street.

PATENT DUCTUS ARTERIOSUS: REPORT OF A CASE COMPLICATED BY PREGNANCY.

BY
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(With Three Illustrations.)

Congenital heart disease is one of the unusual cardiac conditions. Persistence of the ductus Botalli as a permeable vessel is one of the unusual congenital lesions. The occurrence of pregnancy in a patient with a patent ductus Botalli, subsequent delivery at term by Cesarean section, mother and child surviving, is to the best of the author's knowledge, unique.

The existence of the ductus Botalli was first mentioned by Galen. Its physiological importance was first described by Harvey(1). Bernutz(2) in 1847 published the first case with postmortem findings. It remained for Almagro(3) however, to elaborate the pathological findings into a clinical entity.

Many theories have risen and fallen to explain the persistence of the ductus Botalli. Durozier(4) suggested that premature closure of the foramen ovale lead to atrophy of the left and hypertrophy of the right ventricle which in turn produced dilatation of the pulmonary artery and persistence of the ductus arteriosus. A similar line of reasoning was followed by Peacock(5) who considered the patency of the ductus compensatory to intrauterine stenosis of the pulmonary artery, due either to fetal endocarditis or a developmental anomaly. Rokitansky(6) suggested an increased number of circular fibers in the media of the duct, thus preventing its collapse F. Weber(7) thought the persistence due to failure of the lungs to properly expand at birth. Heredity probably plays a small rôle in the etiology of this condition. De la Camp(8) reports six children of healthy parents, all of whom exhibited this anomaly. The true explanation is probably that given by Hinze(9) who examined serial sections through the foramen ovale and found it surrounded by numerous active mitoses. This suggested that a definite stimulation of some type is necessary to effect its closure. He assumes that an absence of this stimulation (Reizzustande) accounts for the persistence of the foramen ovale, ductus Botalli and other similar congenital anomalies. This theory is also borne out by the researches of Pollot(10) who noted in nine cases out of ten that were examined that the duct closed by proliferation of the cells of the intima. In the tenth case the duct was closed by the organization of a thrombus.

Pollot also noted that the closure of the ductus Botalli begins before birth. Lange(11) found that by the fifth to eighth day the pulmonary end of the duct is approximately half its size at birth. At the end of the second week the duct is still permeable for a pin. It is not closed until the twentieth day. The aortic end, however, is open until the fourth week.

It is difficult to estimate either the relative or absolute frequency of this condition. In 1,300 postmortem examinations performed during a period of nine years, Rauchfuss(12) noted the occurrence of a patent ductus on two occasions. Chambers(13) on the other hand, saw the condition twice in 2,161 postmortems. The number of cases reported are few. Gerhardt(14) reported fourteen, Rauchfuss two, Bernutz one, Almagro six, Zürchen(15) thirteen, Brettauc(16) three, Ratner(17) two, Esser(18) two, de la Camp six, Lenz(19) six, Sidlauer(20) one, Ferguson(21) one, Roder(22) two, Burghardt(23) one, Wessler and Bass(24) (personal communication) five, making a total of sixty-five.

Excepting low grades of open foramen ovales, patent ductus Botalli is one of the most benign of congenital cardiac diseases. One of Lenz's cases died at fifty-three. Among the thirteen cases collected by Zürchen, two successfully withstood pneumonia, four pertussis, five measles, one gastroenteritis, three tonsillitis, four scarlet fever, one CO poisoning, one severe burns, two severe cellulitis, one perityphlitis, one typhoid, two bronchitis, one chicken-pox, one diphtheria, and one was operated for an osteomyelitis of the forearm. Roder and Esser, however, each reported two cases of sudden death in infants due to rupture of an open ductus as determined at autopsy.

It may be said of patent ductus Botalli as of a certain type of aneurysm, that it is a condition of physical signs, rather than of symptoms. Some patients complain of slight dyspnea on exertion, occasional attacks of palpitation or a chronic cough. Many are unaware of any cardiac condition until it is accidentally discovered. Only rarely is the patient frankly decompensated.

Cyanosis is not present at birth and seldom appears later. A "white cyanosis" is mentioned by French writers as being of occasional occurrence. Cyanosis may appear, however, and once present, persists, its intensity increasing with time.

Percordial bulging is a constant feature. The apex beat is displaced outward and is usually found in the fifth intercostal space, between midclavicular and anterior axillary line. In the second intercostal space, close to the sternum, a series of undulations, systolic in time, are frequently to be seen. Capillary pulsation is occasionally demonstrable. Gerhardt in 1867 stated that paralysis of the left recurrent laryngeal nerve might occur. It was not until 1901 that a case with this symptom was reported. Gerhardt was also the first to describe a narrow band of dullness running from the upper border of the heart toward the middle of the clavicle.

The subject of this paper is Mrs. T. T., a housewife, twenty years old. She was first seen January 30, 1912. Physical examination besides confirming the self-made diagnosis of pregnancy, revealed the heart condition. The patient is the second of three children of healthy parents. Neither at birth nor since has cyanosis been observed. Teething began at seven months and she walked at fifteen months. The patient has escaped all of the usual children's diseases: measles, scarlet fever, pertussis, diphtheria, etc., nor has she ever suffered from rheumatic fever, tonsillitis or chorea. Menstruation began at thirteen years and has recurred every thirty days since; no dysmenorrhea. Gonorrhea and syphilis are denied, nor is there any reason to suspect their presence. Bowels move regularly without the aid of purgatives; there are no urinary symptoms.

She has had but few subjective symptoms from her cardiac condition. The only ones have been occasional palpitation, a dry cough and attacks during which a humming noise was heard in her chest. These attacks occurred, and continue to occur, approximately three times a week, lasting a few minutes only each time. April 1, 1912, the patient had an attack during which her heart beat more rapidly and forcibly than usual. The attack was ushered in by a beat of unusual intensity, followed by a pause. There was no such beat at the end of the paroxysm. Such an attack has never been repeated.

The essentials of the physical examination taken February, 1912, are as follows:

The patient is 5 feet 2 inches high; fairly well nourished; skin clear, no jaundice; no general glandular enlargement; no anasarca.

Pupils equal and react to light and accommodation.

Thyroid gland not palpable; at the root of the neck, there is a strong palpation pulsation, more marked in the suprasternal notch than elsewhere.

The left chest bulges in the precordial region; the angle of Ludovici is prominent; expansion is normal and equal on both sides.

The lower right anterior border of the lung is at the sixth rib; posteriorly, right and left borders are at the tenth spinous process; slight dulness over the right apex posteriorly. The auscultory murmur over the right base posteriorly, is clear; no adventitious sounds; over all the rest of the chest, the breathing sounds are overlaid and muffled by the loud continuous murmur transmitted from the heart.

The apex beat of the heart is visible in the sixth intercostal space, well localized, forcible; in the second left intercostal space there is a well-defined undulatory movement, synchronous with systole. A strong, harsh thrill is felt over the first to third intercostal spaces. This thrill is most marked in the second left space, just inside the midclavicular line, and ceases abruptly below the fourth rib. Pulses equal, regular, good tension; rate, 84; blood pressure, syst. 120, diast. 85 (Riva-Rocci). The right border of the heart is 4 centimeters to the right of the midline; the left, 12 centimeters to the left of the midline; the upper border is at the upper border of the third rib. There is a roughly triangular area of dulness extending from the upper border of the heart, parallel with the sternum and practically flush with it, upward and slightly outward. Its breadth is approximately 3 centimeters; length, 5 centimeters. The first sound at the apex is impure and accompanied by a faint murmur; second sound normal. The aortic second sound is rough; pulmonic second sound strongly accentuated. At times there was difficulty in distinguishing aortic from pulmonic second sounds; over the base of the heart there would be heard nothing but a harsh rasping murmur interrupted at frequent irregular intervals by short sharp snaps. At such times the murmur could be heard with the ear 1 centimeter removed from the stethoscope, and the effect was similar to irregular beating of a snare drum. The characteristic murmur is best heard in the second left intercostal space, and is transmitted most loudly toward the distal end of the clavicle. It is well heard in the left carotid, less plainly in the right. Below the fourth rib, there is a sudden diminution in the intensity of the murmur, and the second sound assumes the pitch of a kettle drum. With the exception above noted the murmur is heard all over the chest.

The liver and spleen are not palpable; not enlarged; no ascites; uterus extends 1 centimeter above the umbilicus.

I am greatly indebted to Dr. Seeligmann for the following discussion of the obstetrical indications.

There is no clubbing of fingers or toes. Examination of the nervous system, negative. Rectal and vaginal examinations, not made. Urine: albumin very faint trace; otherwise negative.

The patient's condition remained excellent during pregnancy. Morning nausea was present during the first six weeks, only. The urine showed a steady faint trace of albumin.

On April 24, 1912, the membranes ruptured and in accordance with a previous arrangement, the patient was removed to Lebanon Hospital where the operation was performed by Dr. Seeligmann.

"I saw the patient for the first time when she was about seven months pregnant. The time, therefore, for interrupting the pregnancy at an early date was passed, and the problem for the obstetrician was solely to advise that method of delivery at term which would give the best chance for both mother and child. As to the question of interrupting the existing pregnancy then and there, it is clear that a premature delivery at that time meant the same danger to the mother, while it gave a slim chance to the baby. A similar argument could be raised against interrupting the pregnancy a little later, perhaps at the end of the eighth month.

If I am right in claiming that it is impossible to formulate general rules in regard to the prognosis in cases of pregnancy complicated by lesions of the heart, and that it is correct to make an individual prognosis and individual indications for the management of labor in each case, this was surely so in this instance.

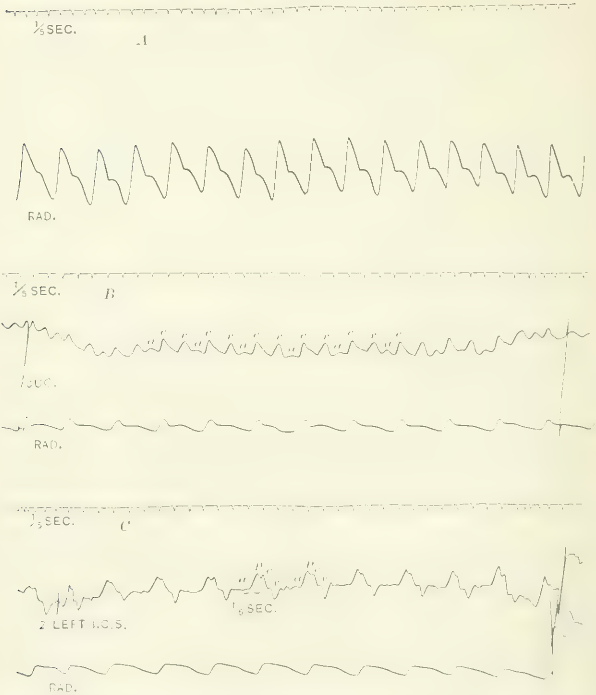

Fig. 1.—Polygraphic tracings demonstrating the nature of the radial pulse as well as the thrill, undulation in the 2 L.I.C.S. and suprasternal notch and jugular and apical tracings.

There was nothing I could find in the literature concerning pregnancy complicated by congenital malformations of the heart. I myself had never seen a case like it, but it was evident that it was for me to decide which method of delivery would be the easiest for the mother's heart. I decided to do Cesarean section at term. The mortality of Cesarean section, if every source of infection can be excluded being nil, I decided to take care that no vaginal examination should be made, that coitus should be forbidden during the last month and that the patient should enter the hospital the moment she felt the first pain and be operated upon at once. In that way the extraordinary task for the heart of sustaining the increased blood pressure during labor, would be excluded.

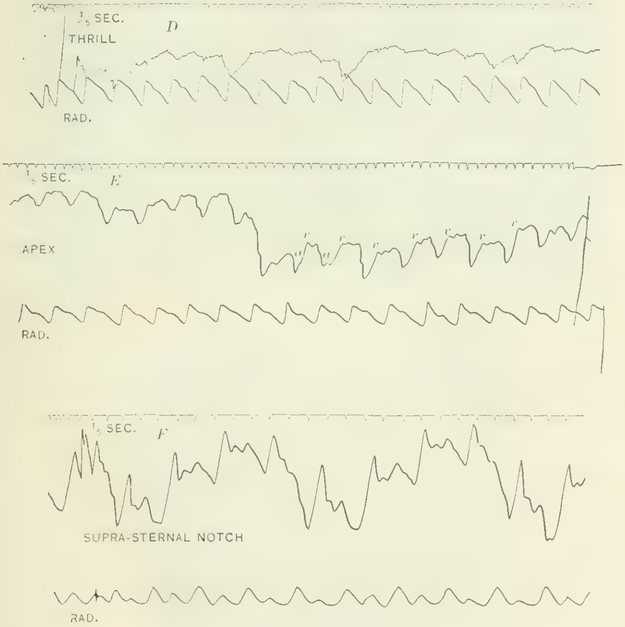

FIG. 1.—(*Continued.*)

The patient had menstruated the last time July 22, 1911. At term, April 24, 1912, the membranes ruptured. No pain. Patient taken to hospital in a taxicab. Immediate operation. Typical classical Cesarean. Living child 7 1/2 pounds. Before closing the abdomen, subperitoneal resection of both tubes. All four stumps ligated, cauterized and carefully covered with peritoneum.

Uterus contracted beautifully. The patient left the table in good condition, heart action unchanged. Recovery uneventful. Obstetrically the interesting point in this case is the question whether

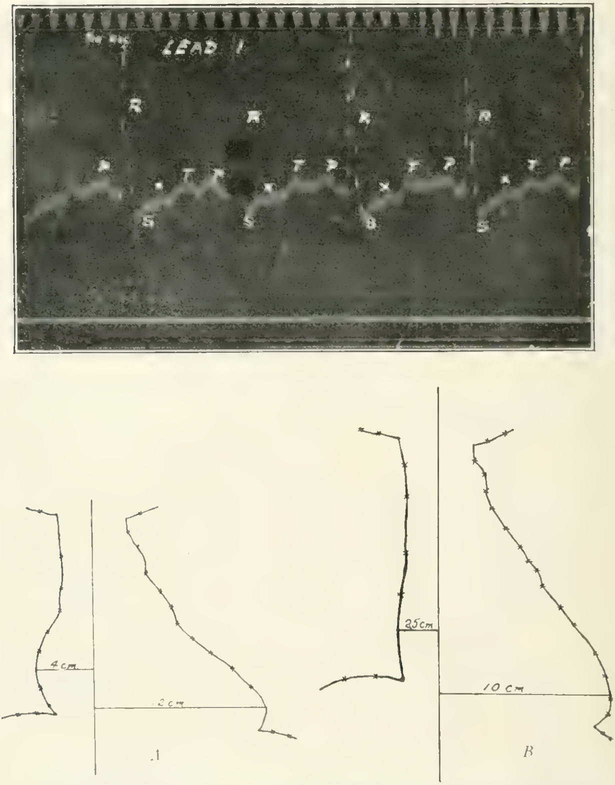

Fig. 2.—Fluoroscopic picture and orthodiagram showing marked retraction of the right ventricle in *b* and aneurysmal-like dilatation of the pulmonary artery in *a* and *b*.

the indication for Cesarean section was well founded. I believe it was."

Polygraphic tracings were taken at frequent intervals. Unfortunately, no tracing was obtainable during that attack the description of which suggested a paroxysmal tachycardia. The radial pulse was not always of the aortic type as described by Lenz, although it frequently showed abrupt rises and falls, Fig. 1, *a*. The venous pulse, Fig. 1, *b*, shows a normal *a-c* interval and normal *c* and

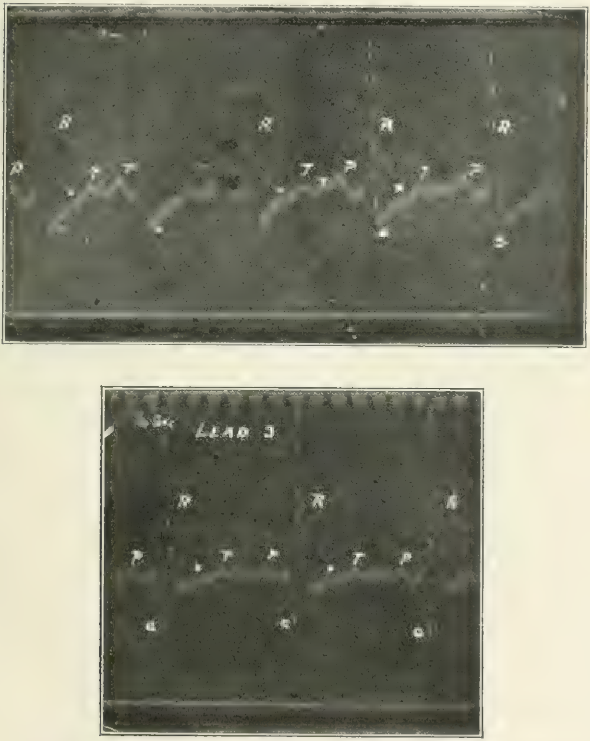

Fig. 3.—Electrocardiographic curves; note that *R* is directed upward; also note waves *X* and *V*.

v waves. The tracing of the undulation in the second left intercostal space, Fig. 1, *c*, shows the continuous nature of this movement, as well as the systolic and diastolic accentuations. The further interpretation of this curve is difficult and uncertain. The *c* wave is seen to be the third wave in the cardiac cycle. The time elapsing between the first and third waves, is exactly one-fifth second. The second wave, *P*, apparently interrupts the first and is due, I think, to the expansile movement of the pulmonary artery, caused by the meeting of blood thrown in by the right ventricle with that flowing back through the patent ductus. A second tracing was taken over the second left intercostal space with the lever, a small flexible aluminium funnel, interposed between the ribs and pressed tightly to the skin, Fig. 1, *d*. This tracing shows the continuous coarse thrill palpable over this portion of the chest. The tracing of the apex beat, Fig. 1, *e*, shows no unusual phenomena. Fig. 1, *f*, demonstrates the tracing taken in the suprasternal notch, and shows that this series of movements is of arterial origin.

A fluoroscopic examination was made in February, 1912, by Dr. L. Peiser, Fig. 2, *a* (redrawn from measurements). In November, 1912, after the operation, orthodiascopic tracings and electrocardiograms were taken by Dr. O. Krehbiel in Dr. I. Adler's office. The orthodiagram of November, Fig. 2, *b*, shows a marked retraction of the right ventricle compared with the previous picture. Both pictures show the remarkable expansile pulsation of an aneurysmal-like dilatation of the pulmonary artery as described by Wessler and Bass in an article at present in press.

The electrocardiograms taken by Dr. Krehbiel do not show the regular inversion of the *R* wave described by Kraus and Nicolai (25), Ratner and others. In addition there are many other anomalies. An exact explanation of the phenomena exhibited by these curves is impossible with our present knowledge. I shall merely describe the curves, hoping that in the near future an explanation will be possible.

In lead 1, the wave *P* shows an almost constant bifurcation. It is followed after the normal interval by an *R* of abnormal height (29 m.v.) *R* terminates in a deep *S* which in turn is followed by a small wave which I have called *X*. It has no place in a normal electrocardiogram. *X* is followed by a low *T* wave and immediately after *T*, there being in most cases no diastole, there follows a *P*. In lead 2, the bifurcation of the *P* wave is less marked. In addition this curve shows a second extra wave, closely following *T*, which I have termed *Y*, although it may be the *U* wave of Einthoven. Lead 3 contains a deep *Q*.

The diagnosis in this case was made on the following points: 1. The lack of any etiological factor for an acquired lesion; 2. the rarity of acquired pulmonary lesions; 3. the lack of marked subjective symptoms; 4. the absence of cyanosis; 5. the character and localization of the murmur; 6. the presence of Gerhardt's sign; 7. the marked pulsation in the second left intercostal space; 8. the localization and character of the thrill.

The clinical picture presented by a patient with an open ductus Botalli is a clear one. Occasionally, however, it may be simulated by other congenital lesions. Thus one case diagnosed by Müller (26) as a patent ductus proved at section to be a defect in the ventricular septum with a dilated pulmonary conus. In this case however the murmur was heard with maximum intensity over the sternum at the level of the third rib. The thrill and Gerhardt's sign were present. Pulmonary stenosis, the only other congenital lesion having any similar physical signs, should be differentiated by the absence of cyanosis, especially after exercise, lack of Gerhardt's sign and the general condition of the patient.

At the time of writing, Jan., 1913, both mother and child are in the best of health. The boy weighs 23 lbs., has three teeth, has never been sick and is free from all congenital anomalies. He was nursed for nine months. The mother has not had a sick minute since leaving the hospital. The attacks characterized by humming noises in the chest still continue, but cause no great inconvenience. Contrary to advice she has frequently danced and felt no ill effects therefrom.

In conclusion, I desire to express my thanks to Dr. Peiser for the fluoroscopic examination, to Dr. Krehbiel for the electrocardiograms, and to Dr. Adler for invaluable aid in preparing the literature and manuscript.

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THE CLINICAL SIGNIFICANCE OF THE URINE IN PREGNANCY.*

BY

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In 1843, fifteen years after Bright reported his types of kidney disease, Lever(1) of Guy's Hospital applied the albumin test to the urine of ten women having puerperal convulsions and found it highly albuminous in all but one instance. He then applied the test to the urine of fifty women at the time of their labor and did not find albumin except in those who had convulsions or in those presenting the preliminary symptoms of convulsions. Ten years later most of the writers of the day considered convulsions occurring in pregnancy due to the retention of urine products in the blood, and about this time the word uremia was coined (1854).

This explanation was not entirely satisfactory for, while convulsions were common in pregnant women having considerable albumin in their urine, in the various forms of kidney disease they seldom occurred. Meigs(2) in 1856 held that albuminuria offered a definite symptom of kidney insufficiency and a warning of impending convulsions but insisted that there were other factors in the causation of the disease.

Attention was attracted to the liver by the report by Matthews Duncan(3) in 1879 of liver necrosis in a fatal case of pernicious vomiting. He noted the similarity of the liver findings to those in acute yellow atrophy. A few years later Jurgens(4) described the liver conditions in eclampsia and in 1893 Schmorl's(5) review of the subject established the liver pathology of eclampsia. Bouffe de Saint Blaise(6) who had written a number of articles concerning the pathology of these conditions, in 1898 expressed the belief that eclampsia was a hepatotoxemia. In 1901 he reported a case of pernicious vomiting with liver findings similar to those in eclampsia. Together with De Ribes(7) he was convinced that pernicious vomiting of pregnancy, acute yellow atrophy and eclampsia were forms of one disease which was due to a toxic principle dependent upon a degeneration of the liver cells.

Minkowski's(8)(9) studies of the liver functions and the nitrogen metabolism in acute yellow atrophy paved the way for the chemical study of the urine in pregnancy. Davis(10) in 1894 reported the examination of the urea excretion (urea plus ammonia) in 80 cases of pregnancy and found that in eclampsia it fell as low as .5 per cent. at the time of the convulsions. He expressly stated that he did not believe the retention of urea to be the cause of the convulsions, but rather as an expression of the functional activity of the excretory organs and he believed that the urea percentage would give a warning of an approaching eclamptic attack.

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*Read before the Section on Obstetrics and Gynecology of the New York Academy of Medicine, March 27, 1913, and also before the Orange Mountain Medical Society of N. J., March 14, 1913.

Minkowski called attention to the increase in ammonia in the urine when the liver fails to synthesize into urea the protein products of digestion.

Wm. S. Stone(11) in 1903 in a review of the subject of toxemia of pregnancy expressed his belief in a single identity of pernicious vomiting of pregnancy, acute yellow atrophy and eclampsia and suggested that the ammonia would be found to be high and the urea low in these conditions. He also called attention to the fallacy of using the hypobromite method for urea determination, as by this method urea and ammonia were combined in the readings whereas Minkowski had shown that the urea was lowered in amount as the ammonia increased.

Williams(12) in 1905 furnished the first ammonia determinations in the hyperemesis of pregnancy. He found that the ammonia went as high as from 20 to 46 per cent. in some cases. He was so convinced of the diagnostic value of the ammonia percentage that he believed it to be an index for intervention and at that time he set 10 per cent. as an indication to induce abortion. In eclampsia he found the ammonia percentage to be variable. He expresses the opinion that it is low at the onset of the convulsions and rises rapidly for short periods.

Ewing and Wolf(13) in 1907 reported cases of toxemia with high ammonia and also with high amino-acid and rest nitrogen. They believed that the increase in the amino-acid nitrogen indicated defective deamination on the part of the liver, of the amino-acids arriving in the portal circulation as the result of protein digestion.

These results were upheld by other observers and were quite generally accepted. Wright(14) of Toronto from a clinical standpoint warned against accepting high ammonia as an indication for emptying the uterus. Underhill and Rand(15) called attention to the fact that starvation or inanition also produced marked variations in the nitrogen partitions and pointed out that practically all the hyperemesis cases were really starving.

At present the pathology of the liver in hyperemesis, acute yellow atrophy and eclampsia is established but as to the value of ammonia and undetermined or rest nitrogen as aids in the clinical care of these cases or as evidences of liver degenerations, a difference of opinion exists.

According to generally accepted views the functions of the liver are (1) the conversion of dextrose to glycogen, (2) the production of bile, (3) the detoxication of poisonous substances absorbed from the intestinal tract or elsewhere, and (4) the changing or deamination of amino-acids and the conversion of ammonia into urea.

The first step in the urea formation is the deamination of the amino-acids, that is the splitting off of NH_2 groups to form ammonia. Until Folin's work was published last year the accepted theory was that a large part of the ammonia was split off from the amino-acids in the intestinal tract. The combination of the ammonia with carbon dioxide occurs in the blood and the dehydration of the ammonium carbonate to urea through the intermediate stage of ammonium carbamate has been generally accepted as occurring in the liver. It is conceivable that any marked liver degeneration might produce changes in one or all of the functions of the organ. One function may be decidedly affected with little change in the others, as in the glycosuria produced by phloridzin poisoning.

As before stated, Duncan correlated the liver findings of hyperemesis of pregnancy and acute yellow atrophy. Jürgens described the hemorrhagic hepatitis occurring in eclampsia and St. Blaise noted the similarity of the findings in pernicious vomiting and eclampsia and expressed the belief in the identity of the three conditions. Ewing(16) gave a very clear description of the pathology of the toxemias of pregnancy and argued for the acceptance of the underlying identity of these conditions.

The lesions of the liver in pernicious vomiting show varying intensity, some have fatty and hydropic degeneration of the cells without necrosis, while the more typical have fatty degeneration and necrosis of the cells about the center of the lobules.

In acute yellow atrophy the necrosis is more extensive, leading to disintegration of the entire lobule and general shrinkage of the liver itself.

In eclampsia the picture is quite typical. Hemorrhagic foci may be found throughout the liver. The degeneration usually takes place at the periphery of the lobule and necrotic areas occur with complete degeneration of the protoplasm. There are capillary thromboses and minute hemorrhages, sometimes at a distance from the necrotic foci.

From a consideration of the physiology of the liver and the pathology of this organ in the toxemias of pregnancy we may surmise that the liver cells do not properly functionate in these conditions. It is said that there are liver changes peculiar to pregnancy, in fact, the "liver of pregnancy" is accepted by some as an entity. In hyperemesis high ammonia with low urea has been reported by a number of observers and in fact I have myself made such observations. The "rest" nitrogen has been found to be high especially in eclampsia. The ammonia nitrogen in eclampsia is said to be low before the attack and high for temporary periods during the attack. The urea in both conditions is low and so also is the total nitrogen.

The adherents to the belief that the liver changes cause a disturbance of metabolism which result in the clinical symptoms known as toxemia, are seemingly placed in an impregnable position; but experience with the nitrogen partition as an aid to diagnosis or treatment has not been satisfactory.

Certain facts concerning changes in the nitrogen and its various fractions must be recalled.

The total nitrogen in a twenty-four-hour specimen of urine is definitely affected by the character and the quantity of food ingested. Intestinal disturbances such as diarrhea effect the amount of food absorbed. In starvation nitrogen excretion is always low. Folin (17) describes two forms of nitrogenous metabolism, endogenous or that arising from the tissues and exogenous or that coming directly from the food. The exogenous nitrogen never really enters into the formation of the body, but varies from day to day, according to the diet.

The largest fraction of the total nitrogen is the urea and it amounts to 80 per cent. or 90 per cent. of the whole. Any decided increase in the other fractions is accompanied by a decrease of the urea. With marked decrease in the total nitrogen there is a decided reduction in the percentage of the urea. The ammonia nitrogen normally amounts to 4 or 5 per cent., and when it rises it is always accompanied by lowering of the urea. Marked reduction of the total nitrogen is accompanied by a relative increase of the ammonia provided the food does not yield an alkaline ash.

Amino-acids are formed as a result of the digestion of protein. It has been supposed that they are deaminated partly in the intestine and partly in the liver. When these acids occur in the urine in increased amount they are supposed by some to show loss of functional activity of the liver, although it is possible that some of the amino-acids occurring in the urine of pregnancy come directly from the processes of digestion in the placenta without having passed through the maternal liver(18).

The undetermined nitrogen consists of higher or polypeptid nitrogens. On a low or nonprotein diet, according to Folin, the undetermined nitrogen is reduced in the absolute quantity but in per cent. of the total nitrogen there is always an increase.

The "rest" nitrogen is a term used synonomously with undetermined nitrogen. It may consist of undetermined nitrogen or in addition to that one or more of the other fractions and usually the amino-acids. In fact by some "rest" nitrogen is erroneously held to be synonymous with amino-acid nitrogen.

Recent experimental work tends to controvert the theory of a hepatotoxemia as the origin of these toxemias and offers the possibility of other explanations for the changes in the urine.

Since the work of Guthrie(19) it has been known that the liver is degenerated in delayed chloroform poisoning. In 1908, Howland and Richards(20) produced delayed chloroform poisoning in dogs and studied the pathology and the metabolism. The livers of these animals showed a necrosis about the central vein of the lobules with fatty degeneration of the cells extending toward the periphery. The picture is practically identical with that of pernicious vomiting. The nitrogen output increases greatly in chloroform poisoning, but the different fractions retain their original proportions, that is the urea, the ammonia and the amino-acids are found in the same percentage amounts.

Whipple and Sperry(21) in their studies of chloroform poisoning have shown the similarity of the liver picture to that of pernicious vomiting and eclampsia. The suggestion has been made that the pathology of these diseases be restudied in cases which have not received chloroform for operative procedures.

Chloral and chloroform have nearly the same pharmacological action. Hopkins(22) investigated the liver pathology of chloral poisoning. He found that it produced degeneration similar to chloroform, but much milder in grade. The nitrogen was increased in amount although it varied in different cases, in the same way as in choroform poisoning. He made no ammonia determinations. partition showed the different fractions to be present in normal ratios.

In the production of phloridzin diabetes the total nitrogen output becomes greatly increased, even up to 200 to 400 per cent. The liver becomes the subject of extreme fatty infiltration. Rosenfeld(23) says that it is not a fatty degeneration of the cell but a degeneration of the albumin of the cell with fat infiltration. Waldvogel(24) believes the process is closely allied to autolysis. Ringer and Lusk's(25) tables show that in the partition of the nitrogen after phlorhizin poisoning the urea, the ammonia and the "rest" nitrogen are not increased in percentage amounts. Wolf and Osterburg(26) studied metabolism after phloridzin administration and they found the ammonia and amino-acid nitrogen to retain practically the same percentage relations, although the total nitrogen was greatly increased.

Pearce and Jackson(27) produced focal necrosis of the liver in dogs by the administration of hematoxic sera. Their experiments show an increase in the total nitrogen in all the cases. In one dog with focal necrosis no percentage increase of the ammonia and the undetermined nitrogen occurred. In another animal with focal necrosis the ammonia nitrogen did not increase more than 1 per cent. of the total nitrogen over that of the highest figures in the pretoxic period. The undetermined nitrogen was increased by not more than 1 per cent. of the total nitrogen for the highest readings. In one of their animals with diffuse liver necrosis, the ammonia nitrogen did not increase by more than 1 per cent. of the total nitrogen on the highest day, and the general average was lower. The undetermined nitrogen was increased to a slight extent but not more than 3 per cent. of the total nitrogen on the highest day.

Underhill and Kleiner(28) administered hydrazine to dogs and studied the metabolism as evidenced by the nitrogen partitions of the urine. Hydrazine produces a fatty degeneration of the liver without decided changes in other organs. It attacks first the cells about the center of the liver lobules. It will destroy as large an amount of liver tissue as will phosphorus but leaves a considerable amount of liver tissue in a fair state of preservation. Their summary is that in this poisoning there is an absence of abnormal relationships in the principal urinary constituents and they draw the inference that through the persistence of a small number of functionating cells the liver is able to maintain its intermediary metabolic processes in approximate equilibrium.

Folin(29) has recently devised methods of determining the nitrogen fractions from small quantities of material. He terms these procedures microchemical tests. They are colorimetric determinations and only a few drops of urine or blood are necessary. He has made determinations of the blood taken simultaneously from the portal vein and from the carotid artery and finds that there is no great difference in the ammonia content of each after the absorption of an amino-acid mixture from the intestines. He finds that the amino-acids are present in practically the same amount on both sides of the liver and finally he shows that the amino-acids after absorption are stored in the muscles where it is probable that they are slowly deaminated and urea is formed. If Folin's recent work is substantiated then we must change our ideas of deamination and urea formation. His results are conclusive concerning the amino-acids passing directly to the tissues and it would appear that some of the urea formation takes place also in the tissues.

Murlin(30) examined the nitrogen over considerable periods before and after delivery in three pregnant women and found that there was in both absolute and relative sense an increase in the amount of creatinin before parturition. Von Hoogenhuyze and ten Doeschate (31) found an increase in creatin in pregnancy and attribute to this fact evidence of distinct hepatic insufficiency, but Murlin draws attention to the fact that their theory calls for a decrease in the amount of creatinin excreted which their tables do not show. He explains the increases in creatinin by two suppositions: (1) That the creatinin excretion is proportional to the increase in the mass of the uterine muscle; and (2) that creatin is formed by the fetus late in pregnancy and is excreted through the maternal organs. The creatin in the antepartum urines he explains by the supposition that the carbohydrate of the food is drawn away for fixation in the fetal tissues, so that it does not avail to prevent the elimination of creatin. This is an explanation similar to that given by Rose(32) for the elimination of creatin by the new-born infant. He concludes that there is no indication in the urine of hepatic insufficiency in late pregnancy.

Heyneman(33) arrived at the same conclusion after studying the creatin and creatinin excretion of pregnant women. He found nothing to suggest that the liver is the seat of any injury from pregnancy and he found nothing to suggest that the liver is especially involved in the production of eclampsia.

Landsburg (34) from a study of the nitrogen, phosphorus and sulphur metabolism during pregnancy came to the conclusion that pregnancy is a purely physiological process.

Murlin and Bailey(35) examined the urine of normal and pathological cases in the last month of pregnancy and found the nitrogen fractions but slightly different from the nonpregnant. There was one case of eclampsia that developed while under observation and who had normal nitrogen partitions before, during and for twenty-four hours after the onset of the convulsions.

In two other cases of preeclampsia the nitrogen partitions were normal. One case of eclampsia with six convulsions had high ammonia for two days while another case with forty convulsions had normal ammonia throughout the period of observation. We have a number of other cases of eclampsia with urinary findings which we shall report shortly.

High ammonia in these conditions may be due to contamination of the urine during its collection or preservation. Contamination may occur from an infected kidney pelvis, from an infected bladder or in the passage of the urine over the vulva and perineum. It must be remembered that practically all of these toxemic cases have albuminous urine and the eclamptics have a very considerable albuminuria. Nothing is more simple than the growth of bacillus coli communis in an albuminous media in the absence of carbohydrates and the breaking up of urea in this way, as Folin remarks in regard to the formation of ammonia in the large intestine.

In all properly conducted metabolism studies on the dog the urine is collected by catheter and the bladder is washed with boric acid solution after each catheterization. The urine is placed in sterile bottles containing thymol and stored at once in the ice chest. No serious consideration should be given hereafter to metabolism studies on women in which the urine collection and preservation are not conducted in much the same way. Since adopting a régime similar to the above it has been impossible to find urines with very high ammonia, that is above one gram, from cases of toxemia of pregnancy, eclampsia, or from normally pregnant women.

There are other explanations for the high ammonia in these cases. Zweifel(36) thinks the ammonia is high to combat an acidosis caused by lactic acid, which he found in eclamptic urine. It has been shown that lactic acid is produced in many convulsive conditions. The largest amount of lactic acid found by Zweifel would only take up 80 milligrams of ammonia, so that the high ammonias could hardly be accounted for in this way. Changes in the ammonia fraction as a result of starvation or under-nutrition have already been spoken of.

Folin shows that a percentage rise of ammonia and undetermined nitrogen occurs when the total nitrogen excretion is low, although the absolute amounts of these substances are less. It has been shown by all observers that in eclampsia the total nitrogen excretion is low, and in this connection I wish to call attention to the fact that in the liver degeneration caused by the administration of certain poisons the total nitrogen is always markedly increased.

The statement has been made that the amino-acid nitrogen is high in toxemia of pregnancy and especially in eclampsia. In order to be of value the amino-acid must be determined directly by some reliable method. "Rest" nitrogen which is composed of amino-acid nitrogen, error in other determinations and higher or polypeptid nitrogen is too general and sweeping a group to be considered together.

In our reported cases there were two cases of eclampsia with normal amounts of amino-acid and one case with amino-acids of not more than 6.6 per cent. before the convulsions. The three pre-eclamptic cases had normal amounts of amino-acids.

Of the other constituents of the urine, the albumin is the most important. In fact it may be said that the presence of albumin in the urine in any decided quantity is the best means we have at present for the early diagnosis and treatment of the later toxemias. Edgar (37) states that 1 per cent. of those having albuminuria later develop convulsions. Williams (38) advises the induction of labor when the albumin increases to 8/10 of 1 per cent. I believe that albumin, especially when accompanied by casts is the best single test we have for determining the efficiency of the excretory organs. It has been suggested that eclampsia is the result of a moderately severe toxemia plus renal inadequacy.

Sondern(39) has held that indicanuria as an index to intestinal absorption is of great importance in these conditions and in the light of recent investigations of absorption from the large intestine it would seem that more attention should be given this subject.

Folin has shown that practically all of the ammonia in the mesenteric veins comes from bacterial growth in the large intestine. He suggests the extreme importance of the finding of ammonia from this source and suggests that other products of decomposition, as indol, skatol, etc., may be absorbed in the same way.

SUMMARY.

It is positive that the liver in acute yellow atrophy, pernicious vomiting of pregnancy and eclampsia is in a pathological condition. The degenerations present would indicate a toxin or toxins of a somewhat similar nature in all three conditions.

In chloroform and chloral poisoning the liver picture is not far different from that seen in fatal cases of pernicious vomiting. In liver degenerations produced by chloroform, phloridzin, hematoxic sera and hydrazine the metabolism is considerably affected as evidenced by an increase in the total nitrogen, but in all of these poisonings the nitrogen fractions retain approximately their normal ratios.

Work reported by Folin during the past year would tend to place the deamination of amino-acids in the tissues chiefly rather than in the liver.

Recent work of Murlin, Heyneman and Landsburg would indicate that the liver functionates normally in pregnancy.

Murlin and I in our observations found that the ammonia and the amino-acid nitrogen were not necessarily increased in preeclampsia or eclampsia.

When an increase in the ammonia occurs it may possibly be explained by changes in the diet or by under-nutrition or to decomposition of the urine by contamination.

CONCLUSIONS.

1. Liver degeneration in the toxemias of pregnancy is accompanied by low nitrogen excretion and by reported changes in the ratios of the nitrogen fractions.

2. Liver degeneration produced by a number of toxic substances is accompanied invariably by an increase in the total nitrogen excreted, but without important changes in the relationship of the various fractions to the total nitrogen.

3. Folin's work would attribute the amino-acid deamination chiefly to the tissues.

4. Preeclampsia and eclampsia may show no marked changes in the nitrogen partitions.

5. It is probable that except for a lowering of the total nitrogen and changes in the various fractions due to the diet and the amount of absorption, the nitrogen partitions in eclampsia will show no great differences in relationship when the urine is collected and preserved by the methods used in metabolism studies in the laboratory.

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269 LEXINGTON AVENUE.

THE FAMOUS CASE OF MARY TOFT, THE PRETENDED RABBIT BREEDER OF GODALMING.

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(With Five Illustrations.)

(*Continued.*)

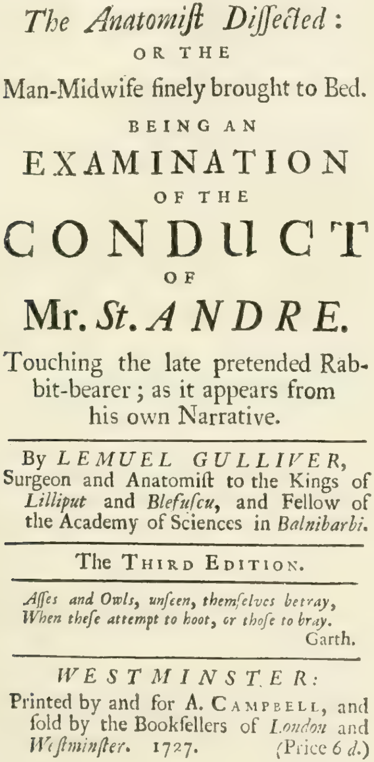
THE ANATOMIST DISSECTED: OR THE MAN-MIDWIFE FINELY BROUGHT TO BED.

After that long and particular Detail of myself, and of my various Adventures in so many different and remote parts of the Globe, as I have lately entertain'd the Public with, I little thought any private Occurrence, in so small a Spot as the Island of *Great Britain*, could have rous'd my Attention, and broke in upon that Repose, in which I hop'd to have spent the Remains of a declining Life. But small and inconsiderable as it is, I consider it is my own Country; the Thought of which, together with that inextinguishable Thirst after Truth and Knowledge, in regard to myself, and an ardent Inclination of communicating it to others, have prevail'd upon me once more to be expos'd in Print, in order to express my Abhorrence of a late diabolical Imposture: propagated, not so much by the Knavery of some, as by the Ignorance and Stupidity of others. I need not say I mean the Rabbit Affair; with which, for some Weeks past, the Minds of the Poeple of this Island have been so seriously and so surprizingly employ'd; so as scarce to leave them any Leisure for Things of a more sublime Nature, and of vastly greater Consequence and Importance.

And tho' I verily believe this to be the real and only Cause, why the Perusal of my Travels has been so neglected of late, which, by the Decay of the Sale, has sensibly affected a worthy and honest Book-seller; yet I declare to the World, that my Motives for entering the Lists against Mr. *St. André* (a person to me wholly unknown, and unheard of till I saw his Name in the News-Papers, upon that unfortunate Accident, which befel him, when he fancied he was poyson'd) are, that little Skill which, by my Education and Experience, I have attain'd in Surgery and

Anatomy, and that great Ignorance in both, which he has betray'd upon this Occasion.

For tho' that Gentleman's Candor is very great in shewing such a remarkable Alertness, at confessing that he has been impos'd upon in this Paltry Business; and tho' perhaps, by that he may flatter himself, that he shall escape all further Censure, yet I shall be at the Pains of Convincing the World that he is mistaken, even in this also; and that, had he not been



The Anatomiſt Diſſected:
OR THE
Man-Midwife finely brought to Bed.
BEING AN
EXAMINATION
OF THE
CONDUCT
OF
Mr. *St. ANDRE.*
Touching the late pretended Rabbit-bearer; as it appears from
his own Narrative.

By *LEMUEL GULLIVER*,
Surgeon and Anatomiſt to the Kings of
Lilliput and *Blefuſcu*, and Fellow of
the Academy of Sciences in *Balnibarbi.*

The THIRD EDITION.

Aſſes and Owls, unſeen, themſelves betray,
When theſe attempt to hoot, or thoſe to bray.
Garth.

WESTMINSTER:
Printed by and for A. CAMPBELL, and
ſold by the Bookſellers of *London* and
Weſtminſter. 1727. (Price 6 *d.*)

FIG. 3.

most profoundly deficient in that discerning Penetration, with which all true Surgeons make Enquiries of this sort, he might have discover'd this Imposture at the very first Sight, and not have drawn in so many Persons of distinguish'd Sense and Figure, to be gull'd and deluded by so coarse and palpable a Fraud.

For, to begin with his Narrative; a true Surgeon, one, I mean, orderly and properly educated in that worthy Profession, would never have suffer'd his Curiosity to be at all alarm'd by seeing a Letter from *Guildford*, which mention'd a Woman's *being deliver'd of five Rabbits;* Suppose one were to see a letter from *Battersea*, importing that a Woman there had been deliver'd of five Cucumbers, or indeed a hundred Letters, would that lead a Man of Sense to believe any Thing, but, either that the Poeple who wrote those Letters had been grossly impos'd upon themselves, or intended to impose upon him. Either of these two Things may, and do happen every Day; but it was never known, that ever any Creature brought forth any one Creature of a Species in all Respects different from it self, much less five or seventeen such Creatures; for which therefore, a man of common Sense, much more a penetrating and quicksighted Anatomist, should look upon all such Letters with the utmost Contempt.

Yet it was the Sight of two or three such Letters (and those flagrant with most conspicuous Tokens of Imposture) which induc'd Mr. *St. André*, at this time of the Year, to take two Journeys to *Guildford*, in order to enquire into the Truth of what, in Nature, it was impossible should be true. However, to *Guildford* he came for the first time; where I shall attend him a while, and watch his Motions, perhaps to a better Purpose than he did those of the Rabbit-bearing Woman: For tho', with all his Skill he was not able to detect her Fraud, I hope with very little of mine to display his Ignorance.

In the first Place, how stupid must he have been, not to suspect a Trick, when *Howard*, upon being sent for, came and acquainted him, *that the Woman was actually in Labour of the fifteenth Rabbit.* This puts me in Mind of what, about six and Forty Years ago, I learn'd at School; where the Sagacity of old *Simo* in the *Andria* of the *Terence* appears, to the utter Shame of our modern *St. Andrians:* The old Gentleman had Reason to suspect Fraud from the known Character of a crafty Knave he had to deal with; and whose Business it was to make him believe, that a certain Lady was just then in Labour: Accordingly, as they approach her House, she contrives to be in one of her Labour Pains, and cries out so loud that the old man must needs hear it; upon which, I remember, he says, with much Humour and Judgment, *Hui, tam citoe ridiculum Postquam ante ostium me audivit stare, approperat. Non sat commode divisa sunt temporibus tibi, Dave, haec.* For thus, had he been credulous enough to go to *Guildford* to inquire into this Cheat, he would have said, in plain *English*, upon the like Occasion, *What a pox, is she so quick? this is the damn'dest Joke that ever was: the Moment she hears I am arrived, she falls into one of her Labour Pains; ah, Howard! this was not well tim'd of you by any means.*

But, to return from this Digression, if the Woman was *actually in Labour of the fifteenth Rabbit*, why should Mr. *Howard* leave her, and stay with Mr. *St. André* till they call'd him again, when she was said to be in one of her Labour Pains? Here a wise Man would have smelt a Rat instead of a Rabbit: And much more, when this Woman in Labour Pains, and who had been in Labour some time then, nay fourteen times before, *was found dress'd in her Stays, and sitting on the Bed-side;* and that not for want of Help to put her to Bed; for there were *several Women near her.* A Man must have spritely Genius for swallowing Imposture that was not stagger'd at such an Appearance. This sure it was that prompted Mr. *St. André* to wave all such Reflections, and proceed *immediately to examine her;* when, tho' by his own Confession, he *did not find the Parts prepar'd for her Labour,* (which was another plain Indication of the Roguery) yet he was weak enough to *wait for the coming on of fresh Pains,* and, *in three or four Minutes after, to think he deliver'd her of the intire Trunk, strip'd of its Skin, of a Rabbit about four Months Growth* (he meant to have said, of an Animal of the Size and Figure of a Rabbit of four Months Growth) *in which the Heart and Lungs were contain'd, with the Diaphragm intire.* Well, what does my Gentleman then? He *instantly cut of a piece of them, and tried them in Water;* in which they swam, and when they were *pres'd to the Bottom, rose again.* Now, it being notoriously the Property of the Lungs of a *Fœtus* to sink, and of a Creature which has been some time brought forth alive to swim, in Water; what but an absolute Prepossession in favour of this filthy miracle, or a consummate Ignorance in these Matters could have hinder'd any sober Inquirer from being determined in relation to this Cheat, by the foregoing Trial? Yet Mr. *St. André* never boggles at this, nor at the Impossibility of the

Trunk of such a Creature's (suppos'd by just before to be alive) being stript of its Skin, by the contractive Faculty of the Womb; nor at the Woman's being *chearful and easy, and walking by her self from the Bed-side to the Fire the Moment she was deliver'd:* But goes on *conjecturing* in a yet more absurd manner, that these Creatures, (as big as Rabbits of four Months Growth, which must be within a Trifle as big as full grown ones), were bred in the *Fallopian* Tubes; and came into the *Uterus* one after another, where they lay and kick'd, till they were press'd to Death, and flead, and all their Bones broken, in such a manner, that they were sensibly heard to snap, by the violent convulsive Motions of it.

I take the Liberty to inform my Readers, upon this Occasion, that the *Fallopian Tubes* are a Passage of Communication, of scarce three inches long, between the *Ovaria* and *Uterus;* thro' which the *Embryo*, after Conception is convey'd from the one to the other. And tho' at that End next the *Uterus* they open, somewhat like the Mouth of a Trumpet, yet, when stretch'd to the utmost, the general Canal of them scarce exceeds the Thickness of ones Finger: And therefore the Impossibility of any one such Creature being contain'd there, much less of eighteen, as this Gentleman suppos'd, must appear to every one of a common Understanding. He tells us, no Blood nor Water issued from the *Vagina* after this Delivery, and that her Pulse was regular. Monstrous! that none of these Indications should open Mr. *St. André's* Eyes. If he thought at all, what could he be thinking of? It is notorious, that in Births of dead Children, Women suffer much more Pain than in those of Living ones; so as to be, during the Operation, in high Fevers, with irregular Pulses, and left in great Weakness afterwards. Yet this Woman is deliver'd of fifteen dead Rabbits, such as of four Months Growth, without the least Inflammation or Laceration in her *Vagina*, walking from the Bed-side, sitting down in a Chair by the Fire, as well as if nothing had happened; and skilful Mr. *St. André* swallowing this foul Imposture, without the least Squeamishness or Reluctance.

In the *Rectum* of this Animal, which remained affix'd to the Body, Mr. *St. André* finds *five or six Pellets, much of the same Colour and Consistence of the common Dung of a Rabbet.* Strange! that this should not alarm him! (it being notorious that the Excrement of a *Fœtus* is always liquid) but this he swallows likewise; as he does *the skin roll'd up and squeez'd up like a Ball* which he delivers her of some time after: And not long after that, of *the Head, with the Fur on, Part of one of the Ears being torn off*. Upon all which Occasions, I mean those of the Womb's having the Faculty of skinning a Rabbit all but the Head, of rolling this Skin up like a Ball, and tearing off a Piece of an Ear; the Gentleman speaks as familiarly as if they were common cases, which wanted not in the least to be accounted for, or wonder'd at.

In the Intervals between these notable Deliveries, Mr. *St. André* diverted himself and his Company, by *examining the several Rabbits, which were kept separate, in distinct Pots, with Spirits of Wine, in the Order that they were brought away.* Here likewise, I will do my self the Honour to attend him. And now, methinks, I see him expatiating, in a very genteel adroit manner, upon the general Resemblance, but particular and significant Difference between them and natural Rabbits.

"*The first,*" says he "*does not appear to be a perfect Rabbit, in all its Parts.* (Here one would suppose, the Difference lay in some one or two, at most, minute, not easily observable, Circumstances, in which this Creature varied from a Rabbit: But, on the contrary, it seems 'twas a perfect Cat in all its Parts, one or two only excepted.) "*Three of the Feet being like the Paws of a Cat; the Stomach and Intestines like those in the same Animal; as also the Shape and Figure of the* THORAX. OBSERVE, *the Lungs and Heart, how entirely they are out of their natural Situation; and squeez'd out between the upper Ribs, and* VERTEBRÆ *of the Neck* (doubtless by the convulsive motion of the *Uterus*) *to which Parts,* OBSERVE HOW *strongly they grow, and adhere. The Lungs of this Creature, had they been plac'd in their natural Cavity, would not have fill'd above a sixth Part of it. The Bones of this Creature are likewise all so different in Substance and Structure from those of common Rabbits*, that o' my Conscience, *the Head and one Paw only excepted,* I think it has not the least Resemblance of them. *All the other thirteen Animals* I pronounce *to be in every particular, like well-formed, common, natural Rabbits, from the size of two Months Growth to four. These have been all broken to pieces much in the same manner; but these several parts are put together in their proper order, they manifestly make up and appear to belong to the abovemention'd Animals.* I confess *the* Viscera *are wanting in four or five of them;* but that is not very material; that Defect is amply supply'd by this *one remarkable Circumstance, which is, that most of these Animals* (for Rabbits I will not call them) *as far as I can judge, are Females. The Flesh* *of these Creatures, particularly of that which I extracted, has the Smell of Rabbits just kill'd; and the Substance of their Bones are, in all respects, like the Bones of* Fœtus *Rabbits.* (How particular, how dilucid, and exact is this part of his Lecture!) *From all these Considerations* (and many more too tedious and impertinent to be recited) with greater Assurance than Knowledge, *I am fully convinc'd, that, at the same time that the external appearance of these Animals is exactly like such Creatures as must inevitably undergo the Changes that happen to adult Animals, by Food and Air, they carry within them the strongest Marks of* Fœtus's, *even in such Parts as cannot exist in an Adult,* and *without which a* Fœtus *cannot possibly be suppos'd to live. This, I think, proves in the strongest Terms possible, that these Animals are of a particular kind, and not bred in a natural way; nor will there be any Doubt Remaining* (*even with the least knowing in these matters*) when these things come to be clear'd up by *the Anatomy of these præternatural Rabbits* (a præternatural Anatomist Thou art without Dispute) *which I shall publish with all convenient Speed, with their Figures taken from the Life, and compar'd with the Parts of Rabbits of the same Growth* (he would have said *the same size*) *that the Differences before-mention'd may be fully understood.*

This therefore the publick has still just Reason to insist upon from Mr. *St. André;* for, however he may pretend to be impos'd upon by others in the Delivery of these Suppostititious Rabbits, the learned anatomical Observations recited above, are purely the Result of his own Skill and Judgment; and cannot with any Colour of Reason, be plac'd to the Account of Fraud and Imposture in others. Especially *those Facts* which he has the Assurance to say *were verified before his Majesty on* Saturday, Nov. *the* 26th, *by the anatomical Demonstration of the first, the third, fifth and ninth of these Animals.*

However, not content with having sufficiently plac'd his Reputation at stake in this audacious manner (for such I must call it) on the wretched Observations abovementioned, *out he sets for* Guildford *again, being resolv'd to bring the Woman to Town if there was any Prospect of more Rabbits.* What could this Creature, this Animal have in his Head to hinder him from concluding that a Woman in such a Condition (were it possible any Woman could be in such a Condition) should not be mov'd out of her Bed; much less out of her House, and much less from *Guildford* to *London.* Yet since he is resolv'd upon another

Expedition, I am resolv'd once more to attend him Thither, and observe his Motions.

And here he is again so keen upon this vile false Scent, that tho' he finds Mr. *Howard* standing at his Door, who tells him the he hop'd all was over, because that he did not perceive in the *Uterus* any Motion as usual, yet he visited her several Times that Day, proceeded in every Respect, with the same Sagacity as before; and towards eight a Clock that Evening, deliver'd her of a Piece of one of the Membranes of a *Placenta* (admirable!) roll'd up like Parchment. This shews how well he is acquainted with the Texture of those Membranes. And his Deficiency in that Point was further confirm'd by a second Delivery of (what he took to be) *another Piece of Membrane, in Structure, Shape and Size, exactly like the former.*

Thus I have touch'd upon, and I hope abundantly expos'd the profound Observations contain'd in Mr. *St. André's* short *Narrative.* Whenever he appears in Print again, upon this Occasion, as I find he threatens to do, I shall again be ready to guard the Public against being deluded by his pretended Discoveries. And, tho' it is not my Nature to insult any Man upon Account of his Misfortunes, whether brought upon him by his own Folly, or the Malice of others; yet give me Leave to say, it is, of the two, a much more eligible Evil, that the Presumption of one ignorant Empiric, should undergo a public Chastisement, than the Understandings, of so many of his Majesty's Loyal Subjects, be corrupted by such sham Demonstrations.

But, after all, as I am a no less strict Lover of Justice, than an indefatigable Searcher after Truth; now my Resentment of Mr. *St. André's* ill Conduct in this Affair, is somewhat cool'd by the Liberty I have taken in censuring and exposing it, I shall offer something, by Way of Abatement of that severe Construction, the World will be apt to pass upon his Judgment in this Affair.

In the *first* Place, I have the Charity to believe he has been egregiously impos'd upon, in Relation to the Character he has publish'd of Mr. *Howard*, whom he stiles, *a man of known Probity;* whereas that Name is as notorious at *Guildford*, and the Parts adjacent, for denoting a Whisker, as ever mine was at *Redriff*, for establishing a Truth. *Secondly*, it must be consider'd that the Pleasure of being talk'd of, and heard to talk, in all Companies public and private, as the very second Discoverer (Mr. *Howard* being indisputably the first) of this extraordinary and præternatural Production, must needs swell the Mind of a raw Practitioner with Vanity, and make him run blindfold into a Series of Absurdities; no one of which, at another Time, would have found any Admittance within the Bar of his Judgment. And *Thirdly*, The Nature of Climates, together with the several Makes, Capacities and Tempers of the Inhabitants of different Countries, are the Reason why Things may appear puzzling and perplexing in one Place, which in another would be accounted for, with the greatest Ease and Certainty imaginable; and why that, which is here a Cause of the highest Ridicule, in a contrary Part of the Globe, would be the Occasion of raising a Man's Character to the most exalted Pitch of Dignity and Reputation.

For Example, had a Native of the Kingdom of *Lilliput*, happen'd to be in this our Island, when the Story of the Rabbits was first vented at Court; and had such a one been dispatch'd to *Guildford*, in Order to enquire into the Truth of that Matter; upon the first View of those Pellets, against which Mr. *St. André* had no Objection, he, with his fine microscopic Eyes, would have instantly discover'd every particular Herb the Creature had fed on that Meal. And what Mr. *St. André* calls *a dirty-colour'd* Mucus, *such as is constantly found in the Bowels of all* Fœtus *Animals, and such as in those that void their Excrements in Pellets, is commonly hard and dry*, our *Lilliputian* would have distinguish'd to have been nothing but a Parcel of mere Rabbit's Dung, which to him would have appear'd as coarse and large as a Scavenger's Load, fresh taken from a Butcher's Lay-stall would do to us. And that which, *in the middle of the Gut* Ilium *of the Cat*, Mr. *St. André* thought was *like a very small Fish Bone*, the more quicksighted little Man would have demonstrated to have been nothing more than the Bones of a Herring, which that Creature had devoured a few Hours before it was thrust into the *Vagina* of *Mary Toft's Uterus*. Tho, as Arts are very much improv'd with us, I question whether a very ordinary magnifying Glass, such as Children use to divert themselves with, might not have made the Discovery as well.

But, if I am rightly inform'd as to the Nature of Mr. *St. André's* Education, I am strangely surpriz'd that He, of all Poeple, should appear so unacquainted with the Materials of which the Strings of a Fiddle are compos'd.

Again, tho', in any of the *European* Nations, those that pretend to any Skill in Anatomy or Midwifery would be scouted to Eternity for only questioning, or going to make Inquiry, whether it was possible for a woman to be delivered of eighteen Rabbits, from two or four Months Growth; or a *Fœtus* of that Size, but just dead, and whose *Flesh smelt like that of a Rabbit newly kill'd*, should be voided in Fragnents and Bits; or the same Woman, notwithstanding all these Deliveries, should be, during the whole time, perfectly healthy and well, feeding on nothing but Beef, Red-herring, etc., or that a Piece of Hog's Bladder could be part of the *Chorion*, or Membrane of the *Placenta;* yet give me leave to say, that in the Kingdom of *Balnibarbi*, these things would appear in quite another Light. There, tho' a *Virtuoso* should only endeavour at a Demonstration of this kind, spend many Years in the Attempt, and all his Labours prove abortive at last, yet would his Suppositions be sure to meet with so kind a Reception from the publick, as to procure, at least, his being adopted, *neurine contradicenté*, into the Academy of Sciences there; (of which I profess my self an unworthy Member). Nay, it is ten to one but he would be taken up into the floating Island, and appointed Anatomist extraordinary to the Court of *Laputa*,

Such is the Use I am always determin'd to make of this my Knowledge of the World and Mankind. As I will not suffer any upstart Pretender, of what Profession soever, to monopolize and vend his Absurdities within this my native Country, without such Animadversions as may serve to warn the publick against him: So, on the other side, if he happens to have any Merit which would shine and be destinguish'd in other Regions of the Earth, I shall be ready to do Justice in that Point also, by letting him know in what part of the World he may be sure to find a proper Reward.

But I can't conclude, without seriously lamenting the great Detriment like to accrue to our Nation by the Stir which has been made about the foul Imposture, both by the Actors and Examiners of it; and that as well in regard to the Warreners and Poulterers, (who complain that the Consumption of Rabbits, within the Metropolis, is become, by two thirds, less than it was formerly;) as in relation to those obcene and indecent Images, which for more than these nine Days last past, beyond all Example, have fill'd the Minds, and furnish'd out the Conversation of Poeple of all Ranks, Ages and Conditions. And whether Ideas of this Nature are fit to be put into the Heads of rude Boys, Boarding-school Girls, and Old Maids, I leave every discreet and prudent Matron to judge.

Finis.

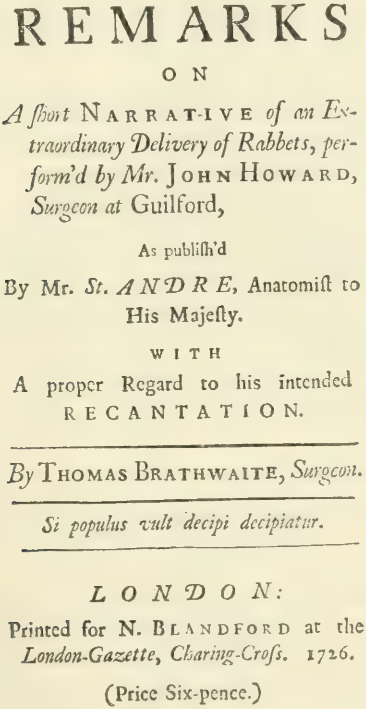
THOMAS BRATHWAIT'S REMARKS.

To the Learned and Profound Dr. Meagre.

Sir,

I reflect with Pleasure on your unwearied Endeavours to detect the Imposture of the Woman of *Godliman*, and cannot enough admire the Rhetorick you wasted and the Time and Courtship you lost upon the profligate *Mary Toft:* Neither ought your Condescension to be forgot, if it be true, that you try'd to kiss, tickle and cajole her out of the Confession she afterwards made. These and other weighty Considerations soon determined me to choose a man of your known Penetration and Sagacity for my Patron. Neither did I regard the Persuasions of some of my Friends, who advis'd me to dedicate to the Sooterkin Doctor, or to the Sage Gresshamite. And here I can't help congratulating you on the Discovery of this wonderful Cheat, and on the Success of your no less wonderful Pill; and though some Poeple that are not thoroughly convinc'd of the Importance of your medicinal Merit, may, upon this critical Occasion, call the Energy and Efficacy of your Pill in Question; yet for my Part I rejoyce with you, to think what a fair Opportunity you now have, of convincing the World of the specifick Harmlessness of the *Pillule*, and of expatiating upon the stupendious Effects it boasts of: Nor shall my Endeavours be wanting, if requir'd, to do any Pills or Packets of yours the Justice they deserve. And notwithstanding it may seem to some prejudiced Persons to savour of Quackery in a Licentiate of the College, to make a *Nostrum* of a common mercurial Pill; yet it may not be impossible to find out some Examples at least in our Profession, to keep your Modesty in Countenance upon that Head; I am sorry to say that I have my self met with an Elder in Surgery, every whit as eminent in the venereal Practice as your self, though less learn'd, contending for the Merit of his surprizing Knack of making Wax-Candles; and I'm sure your cannot value your self more upon being a Pedagogue and a Pill-maker, than he does upon his being a manual Operator and Candle-dipper.

Neither do I think it any more inconsistent for a Doctor to have been an Usher of a School, than for a Dancing-Master to be an Anatomist, or a Surgeon to turn Wax-Chandler. I know you'll excuse this Digression, when you consider 'tis meant in Behalf of your Pill, and in Reverence to your singular Parts and peculiar Endowments; and therefore I shall not any longer chocque you with the Praise either of your Pill or your Person, but with suitable Humility, I beg leave to subscribe my self



REMARKS

ON

A ſhort NARRATIVE *of an Extraordinary Delivery of Rabbets, perform'd by Mr.* JOHN HOWARD,
Surgeon at Guilford,

As publiſh'd

By Mr. *St. ANDRE,* Anatomiſt to
His Majeſty.

WITH

A proper Regard to his intended
RECANTATION.

By THOMAS BRATHWAITE, *Surgeon.*

Si populus vult decipi decipiatur.

LONDON:

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FIG. 4.

Your Constant Admirer,
T. B.

Preface.

It's well-known that the Town has lately been amused with idle Relations by the *Gullivers*, *St. André's* and *Howards* of the Age; and it is as certain that these Amusements have been carried on in their respective Capacities, of Surgeons, Captains, Dancing-Masters, Anatomists, Men-midwives, Warreners, Coney-Catchers, etc., and they don't stick to tell us that there are men of the Size of one's little Finger, and others Sixty Foot high, and that there are Flying Islands and Rational Horses; that Human Excrements may be reduced to their primative Ingredients, or at least may be changed into PORRACEOUS Matter, and that *Mary Toft* of *Godliman* has been delivered of Seventeen Rabbets; and that notwithstanding the Fraud is detected, an account of the Delivery of the Eighteenth will be soon publish'd. When I reflect upon this strange *Gallimatias*, I am chagrin'd to think that the valuable Arts of Surgery and Anatomy must necessarily be brought into Contempt by such *monstrous Relations*. This Consideration has induced me to lay open some of the gross Impositions, as far as they relate to the Profession, and as some of these Accounts are not only false, but even bordering on Farce, I am inclined to treat them in the Manner I think they deserve.

REMARKS, ETC.

Whatever may be the Fate of the Author of the *Narrative*, I think my self oblig'd, for the Sake of the Truth, not only to detect the Facts he has so gravely asserted, but also to help him in his intended Recantation in the best Manner I am able; and that nothing may be wanting on my Side, I shall endeavour to point out to him some of the absurd Passages of the *Narrative*, in the same Order and Light as they have occurr'd to me; and that his Recantation may be the more sincere and compleat, and for Fear he shou'd be too partial to himself, (as Authors generally are) I have carefully avoided Flattery; and on the other Hand, have endeavoured to give him my Remarks, in such a Manner as may be most useful to him in his Design of discrediting *Mary Toft's* Confession, and of making his own Skill and Innocence the more plainly appear. And here I can't help taking Notice, that our Author, seeming to foresee the Occasion there might be for a Recantation, and being conscious to himself of the manifest Absurdity of his Relation at the very Time he wrote it, assures us in the very first Page, "That Mr. *Howard*, his Colleague, intended shortly to publish the whole Account, and prove every Circumstance of it, by such Evidences as will put this Matter out of all Possibility of doubt." Happy had it been for St. *André* and his Coadjutor *Howard*, if they had not heard of the *Depositions* from *Surry*, and those of the Porter at the *Bagnio* and of their Patient *Mary Toft*. "But surely it cannot be doubted, but that all Persons that are not governed by Prejudice, in Favour of the Author of the *Narrative*, or some worse Motive, will suspend their Belief of any Thing this Author has already asserted, or is like to assert on this or any other Subject, 'till Facts come to their Knowledge by a more certain Way than by such flying Reports and absurd Conjectures."

I chose to make use of his own Words to prevent mistakes; and can't help taking Notice, with what Warmth he sets out with the Panegyric of his Brother *Howard*, and tells us of his known Probity, Character and Capicity; and adds farther, that he has practis'd midwifery for above Thirty Years. Now, surely, if Brother *Howard* has any Gratitude left, he will not be behindhand with the *Narrative* Writer in Complement, but must at least say as much of his Brother-Warrener's known Probity, Character, and Capacity, etc., especially at this Time, when perhaps all that he can say to that Purpose, will be little enough.

But to return. The Author of the *Narrative* goes on to confirm his Accounts by two Letters from his Brother *Howard*, the first dated the 6th of November; the Substance of which is, "That he had *delivered* the Woman of three more Rabbits, that the last of them had leap'd in her Belly for the Space of eighteen Hours before it died, and that the Moment it was taken away, another was perceiv'd to struggle for Birth." A lively Instance of the Probity of *Howard*, and of the Readiness of his Associate to believe him! But we shall soon see how these worthy Operators, like their Rabbets, *jump'd* together both in their Opinions and Operations. But more of this after quoting the second Letter, which is as follows, *viz.*

Sir,

Since I wrote to you, I have taken or deliver'd the poor Woman of three more Rabbets, all three half grown, one of them a dunn Rabbet; the last leap'd twenty-three Hours in the *Uterus* before it dy'd. As soon as the eleventh Rabbet was taken away, up leap'd the twelvth Rabbet, which is now leaping. If you have any curious Person that is pleased to come Post, may see another leap in her *Uterus*, and shall take it from her if he pleases; which will be a great Satisfaction to the Curious. If she had been with Child, she has but ten Days more to go, so I do not know how many Rabbets may be behind. I have brought the Woman to *Guildford* for better Convenience.

I am, Sir,
Your humble Servant
John Howard.

Upon the Credit of these two ingenious Letters, that appear to have neither Sense nor *English* in them, and that carry suspicious Marks almost in every Line, our celebrated *Anatomist* hyes down to his Brother *Howard* at *Guildford;* and to palliate the Matter, prevails on a worthy Gentleman to bear him Company; and there finds the Coney-breeder (as he says) actually in Labour of the Fifteenth Rabbet; and after due Examination and patient Waiting for Labour-pains, he tells us "he DELIVERED her of the entire Trunk, stripp'd of its Skin, of a Rabbet of about Four Months Growth, in which the Heart and Lungs were contained, with the *Diaphragm*, entire." He tells us further, of his cutting off a Piece of them, and of his trying of them in Water. A fine Opportunity of shewing his Probity if he had been so disposed! And then he goes on to say, that the Lungs seem'd but just specifically lighter than Water, and that upon pressing them to the Bottom they rose again, but very slowly.

Now it is plain to the Experience of every Body conversant in these Enquiries, that the Lungs of all *Fœtus* Animals that have not breathed sink in Water; and that if ever an Animal has breath'd, tho' never so small an Infant, their Lungs as constantly swim, and are as light or lighter than Cork: Whereas our Anatomist is with much ado brought to own that these Lungs were lighter than Water, and that they rose from the Bottom but with Difficulty. A plain Proof that these Lungs belong'd not to a *Fœtus* that died before Birth, but to one that had breath'd; and of our Author's Aversion to own it; and sure if he had not a Design to gloss over this Matter, he would not have insinuated that these Lungs differ'd from the Lungs of Rabbets that had liv'd and breath'd some time.

The next Thing he mentions, is the Largeness of the Heart, and that the *Foramen Ovale* was entirely open. This puts me in Mind of the Parts of the Rabbets that I took out of the Operator's Coney-Basket at the *Bagnio*, where I found a Hole forced thro' the Verge of the *Foramen Ovale* in two of the mangled Trunks that, to use his Phrase, he exhibited at the *Bagnio*, to confirm the Truth of the extraordinary Delivery, even at the very Time the Detection of the Fraud was depending: A singular Instance both of his Probity and Modesty!

He then goes on to shew his Skill in Comparative Anatomy, and asserts, that "these Lungs were remarkably smaller and of a much darker Colour than commonly the Lungs of such Rabbets which have breath'd for some Time." In order to explain these Difficulties in his Recantation, I would advise him to own fairly that he is uterly ignorant of the Size of Rabbets Lungs, or that he knew very well that these were Parts of natural Rabbets that had lived and breath'd; but that he thought fit to colour the Cheat, and to represent them otherwise.

Next comes a material Assertion indeed, *viz.:* "No Person but my self touch'd her from the first Time that I had examin'd her, to the Time of her being *delivered by me";* and consequently, we must be apt to Think That no Body could Convey the Pieces of Rabbets into the *Vagina* without his Privity. This Passage I think it behoves our Author to clear up well in his Recantation, otherwise the censorious World will be apt to have Recourse to the Despositions of *Mary Toft*, to see this matter in its true Light.

But he is somewhat beholden to his Friend Sir *Richard Maningham*, who tells us in the 10th Page of his *Diary*, that St. *André* in Discourse with him at *Guildford*, added, "That had he not actually delivered the Woman of Part of a Rabbet from the very *Uterus* itself, the Circumstance of the Piece of Hog's-Bladder would have induced him to suspect the Fraud as well as Sir *Richard* himself." And again in the 17th Page of the said *Diary*, Sir *Richard* tells us, "that St. *André* was convinc'd that he had Taken a Rabbet from the Uterus."

He then proceeds to a second Examination of the Woman, and says, "he found that in the Course of the *Fallopian Tubes* there were some Inequalities, but more sensibly on the right Side of her Belly." If our Author had been feeling the *Cornua Uteri* of a pregnant Doe-Rabbit, or of some other parturient Animal, he might possibly have felt the Inequalities he mentions; but sure he is the first Man that ever felt Inequalities in the *Fallopian Tubes* of a Woman thro' the out side of her Belly. He then favours us with his Conjectures that the Rabbets were bred in these same *Fallopian Tubes;* and his Zeal for the Credibility of this Imposture, carries him so far as to account for the Woman's Agitations and for the pretended Exclusion; and to shew us his Skill in Midwifery, he tells us, there was no Blood nor Water issued from the *Vagina;* a likely Sign of a Delivery! when every old Woman knows there never was a Delivery without both. He then talks of Milk in one Breast, and yellowish *Serum* in the other; and without staying for the Remainder of the Rabbet, our Author leaves the Woman to be delivered of the lower Part of a Male-Rabbet by the Nurse; and in order to account thorouly for this absurd Labour, he says, he found it to tally with the Trunk, which he had before extracted. He then tells us he found five or six Pellets in the *Rectum* of this Animal, much of the same colour and Consistence as the common Dung of a Rabbet; the like he says was observed of those Rabbets which had come away before. 'Tis a little strange that these Rabbets should have Pellets in their Dung if they had never fed; What Pity it is, our *Narrative*-Writer should have so little Skill in Anatomy, or so bad a Memory. But on he goes, and tells us *notwithstanding*, that there was a dirty-colour'd mucus, of the Nature of that constantly found in the Bowels of all *Fœtus* Animals, besides the Pellets of Dung, in which Mr. *Ahlers* afterwards found small Bits of Hay, Straw and Corn; and then he would have us believe, that he found a very slender brittle white Body, which in Shape was like very small Fish Bones: which I would earnestly advise our Author to pick very clean in his Recantation, that the Town may digest his *Narrative* the better. The next Paragraph is too remarkable not to quote entire.

"Between six and seven the same Evening we again visited her; we had not been there long, before she fell into violent Labour-Pains, insomuch that four or five persons cou'd hardly confine her to an Arm-Chair: As soon as the Violence of the first Pain was somewhat abated, I examined her as before, and found the *Vagina* perfectly clear; and the Orifice of the *Uterus* so far closed, as not to admit of the little Finger. I constantly stood before her nor did any Person whatsoever touch her during the Time. After three or four very strong Pains, that lasted several Minutes, I delivered her of the Skin of the abovesaid Rabbet, rolled and squeezed up like a Ball, without the least Moisture or Blood about it, upon which she recover'd of her Pain."

"From that Time I did not stir from before her; nor did I withdraw my Hand, but to deliver the Skin to a Stander-by."

How our Author will reconcile his not stirring from her, nor withdrawing his Hand, but to deliver the Skin to a Stander-by, with the Innocence he professes in the Advertisement of his intended Recantation, is as difficult for me to imagine, as not to believe what *Mary Toft* has declared on that Head.

And now, to crown the Work, he again delivers her of the Head of a Rabbet with the Furr on; *also without Blood or Moisture;* nay, we don't so much as hear of Butter or Pomatum to facilitate the Labour, and make the Trick more glib.

Now to recatipulate. We find *St. André* delivers her first of the Trunk, then the Nurse delivers her of the lower Part of a male-Rabbet; he in his Turn takes out the Skin, rolled and squeezed up like a Ball, (a pretty Conveyance) and last of all comes the Head with the Fur on; wherein I afterwards observ'd at the Bagnio, that the Cartilages that cover the Processes of the *Occiput,* were notch'd with some sharp Instrument; and indeed to do the Operator Justice, (whoever he was) the Head seemed to be dexterously separated; and I very much question, whether *Mary Toft,* even with *Howard's* Assistance, could have done it so well.

And here I can't help declaring my Astonishment, to think that our Anatomist could possibly overlook the many Incisions and Lacerations, both of the Abdominal and other Muscles of the mangled Fragments that were pretended to be deliver'd from the *Uterus* of Mary Toft, which I observ'd at the *Bagnio;* and besides took Notice, that the Feet of almost all the Rabbets were cut off to prevent scratching: So careful were some of the Coney-catchers of hurting the poor innocent Rabbet-breeder.

Then to shew us that he was aware of more Rabbets, he tells us, "That at Parting he found those Lumps, which still were in the same Place as before mentioned;" Another Difficulty to reconcile with his Innocence! And now he comes to his sham Monster, which he says, did not appear to be a perfect Rabbet in all its Parts, three of the Feet being like the Paws of a Cat, the Stomach and Intestines like those Parts in the same Animal, as also the Shape "and Figure of the Thorax, the Lungs and Heart of which, he says, were entirely out of their natural Situation, and *squeezed* out between the upper Ribs and *Vertebræ* of the Neck, to which Part our Anatomist says they strongly grew and adhered." I luckily had an Opportunity of detecting this particular Fraud my self; for whilst our Operator was shewing his Monster last *Thursday* Sen'night in the Dining-room of the Bagnio, in the Presence of Dr. *Stewart* and Mr. *Geekie*, Jun. the Surgeon and Mr. *Barnivelt* the Apothecary, and several other Gentlemen, I convinc'd those Gentlemen, and I believe the Monster-monger himself, that there was no Adhesion of the Heart and Lungs to the *Vertebræ* of the Neck and upper Ribs, as he asserted; but rather, that some ingenious Person, a Well-wisher to the Cheat, had reversed the Heart and Lungs, and *Squeez'd* them out of their natural Cavity, in order to make a pretended Monster; and in the Presence of these Gentlemen I return'd the Parts to their natural Situation before our Author's Face, tho' he was pleased to say I could not. But Mr. *St. André*, more loth to own the Truth than seem to agree with his boasted Innocence, would still cavil, and pretended that the Blood-Vessels were not rightly disposed 'till I shewed the contrary both to himself and to the other Gentlemen, just after he had opened the *Thorax*, by cutting thro' the *Sternum:* And upon asking for the Head of this Monster, he shewed me the Skull of a Rabbet; which, he said, his Brother *Howard* assured him belonged to the Trunk of the Cat I had before examined. A proper Evidence for that Purpose! In order to make this Imposture appear the more plausible, I suppose some of the ingenious Persons that were at the Bottom of the Cheat, had cut a Cat to Pieces in like Manner with the Rabbets, and withal to make the Delivery appear the more extraordinary.

After a tedious Detail of our Author's Dissection of the Rabbets, he tells us "that tho' these Animals were exactly like those that undergo the Changes that happen to Adult Animals by Food and Air, yet they carried with them the strongest Marks of *Fœtus's*, even by such Parts as cannot exist in an *Adult*, and without which a *Fœtus* cannot possibly be supposed to live"; and yet he has before asserted in Page the 17th and 18th of his *Narrative*, "That he could not discover in any of the Livers he examined, the *Ductus Venosus*, nor the Implantation of the *Umbilical* Vein"; without which *Ducts* it's impossible for a Fœtus to exist a Moment, and indeed it is equally impossible for a *Fœtus* to be form'd without them. If our Author can make these Things Tally with Skill in Anatomy and Innocence, for my Part I shall be willing to believe the *Narrative* without the help of a *Recantation* to explain it. But to go on with *the*

Show, he farther endeavours to prove, in the strongest Terms possible, that these Animals were of a particular Kind, and not bred in a natural Way; and I wish, for the Credit of these two clever Operators, that they don't prove to be of as particular a Kind themselves when *Mary Toft's Confession* appears.

There's another Passage I cannot pass by; where he says, "That there will be no Doubt remaining of what he has been before asserting, even with the least knowing in these Matters, when those Parts which are subservient to the Circulation of the Blood and Nourishment, between the *Adult* Creature and its *Fœtus*, are brought away; which I am fully satisfy'd, says he, must shortly happen, or if retained, be the Cause of this Woman's Death." An ugly Conjecture! If the Fraud had not been detected, who knows but the Persons that are said to have poison'd the Anatomist, might have bestow'd a Cast of their Office on poor innocent *Mary Toft?*

He then proceeds to inform us, that all these Facts were verify'd before his Majesty on *Saturday* the 26th of *November*, by the Anatomical Demonstration of the First, Third, Fifth and Ninth of these Animals; which he says were compared with the Parts of two natural Rabbets, the one of the Age of four Months, and the other of five Days, Dr. *Steigerthal* and Dr. *Tessier* being present. How true this Verification was, those gentlemen are best able to tell us, and I hope they'll take a proper Time to do it, to the Edification of his Majesty's Anatomist, and to the Honour of his Recantation. But here it may not be improper to consult Mr. *Ahler's Postscript*, *viz.*, etc. . . . . . After this, our Author tells us, "that with all convenient Speed he will publish the Anatomy of these præternatural Rabbets, with their Figures Taken from the Life, and compared with the Parts of Rabbets of the same Growth, that the Differences before mentioned may be fully understood." But I hope I have in some Measure saved him the Trouble; and that the Publick will very readily excuse his delaying these Prints till his Account of the Delivery of the 18th Rabbet is ready to come out. Our Author, still intent upon his Comparative Anatomy, and not considering how he has embarrassed his Recantation, goes on to acquaint us of the Difference he found between two common Rabbets, that he says he dissected before Mr. *Molyneux*, and those he calls the præternatural ones.

In the Course of his Dissections he assures us, that he found the Lungs of a common Rabbet 20 times bigger than the same

Parts of what he calls the præternatural one, tho' he agrees they were much of a Size, that is, about 4 months Growth. *Quære* whether this Dissector ever saw a *Fœtus* Rabbet four Months old? He tells us too, that his other common Rabbet was barely fifteen Days old; and yet he says the Lungs of it were at least 8 times bigger than the Lungs of his præternatural one, (which was about the Size of one four Months old). Sure our Author had his *Microscopical Spectacles* on when he magnified his Objects at this prodigious Rate in his natural Rabbets; and must have been at a vast Distance from his præternatural Conies, when they diminish'd in a Vicessimal Proportion. But for my Part, who only view'd his præternatural Rabbets Lungs at the *Bagnio* with my *naked Eye*, I could discover nothing different in their Structure or Proportion from natural Rabbets. How far our Author's *Optics* may have been disordered, by *Poison*, or too hard Study, he will do well to set forth in his promised Apology.

Our Author goes on with his Microscopical Observations; and in the Stomach and Intestines, pretends to observe, "that the Difference was so *notoriously* great from those he had examined, that even in the Sucking Rabbet, (he says) the Stomach and Cæcum were at least three times larger than those Parts in the præternatural ones." *Quære* whether our Author makes a proper Allowance for the Pellets and Mucus he found in the Dung of his *Fœtus?*

I much wonder, that with all this Penetration and Sharpsightedness, he did not discover the Pieces of Hay, Straw, etc., that Mr. *Ahlers* and other Gentlemen discovered in the Fæces of his Animals; and it is as strange to me that our Author's Anatomy should all turn one way, and still in favour of an Event, that he said himself he has at length with much ado found out to be an Imposture.

And that our Anatomist could take his Rabbets for Fœtus's, when, as I hinted before, he does not so much as pretend to have discover'd in them either *Umbilical Vein*, or *Arteries*, or *Urachus*, or *Ductus Venosus*, all which are absolutely necessary to the very Being of a Fœtus, is beyond my Conception; and how he came to take no notice of the longitudinal and oblique Incisions in the abdominal Muscles, and the Marks of Violence I observed in the torn Parts of the Viscera of the Abdomen, is equally amasing to me. But perhaps his next Book will account for these and other surprising Phænomena, that appear'd in his monstrous Fœtus's.

We now come to our Author's second Journey to *Guildford* on the 22d of last Month, where, after a frivolous Account of Labour-pains, etc., he tells us, that his Patient, *Mary Toft*, voided a piece of one of the *Membranes* of the *Placenta*, rolled up like Parchment; and that when it was extended, it measured about six Inches over. In order to explain this Passage, and farther to illustrate our Author's Probity and Innocence, I beg Leave to quote Sir *Richard Maningham's Diary*, Page the 11th and 12th.

(See Maninghams Diary, paragraph beginning "Mr. *John Howard* brought us, wrapt in a Paper," etc., to paragraph ending "but the Women about her said, it was because she supposed I thought her a Cheat.")

Upon this, Sir *Richard*, suspecting the Fraud, says, that he call'd for a Hog's Bladder, which it seems they had ready, and which added to his Jealousy; he tells us too, that he compared them, and that they were alike, and had both the same urinous Smell; he also informs us, that Mr. *John Howard* and Mr. *St. André* bid him have Patience, and he shou'd be satisfied; but it seems, Mr. *St. André* cou'd not then help owning, "That had he not actually delivered the Woman of Part of a Rabbet from the *Uterus* itself, this Circumstance would also have induced him to believe the whole a Fraud."

But we see, that notwithstanding the Discovery of the foisting in of the Piece of Bladder into the *Vagina*, our Anatomist never pretends to suspect the Cheat any more either at *Guilford* or *London*, 'till other Poeple found it out for him; but after this Affair of the Bladder, he publishes his *Narrative*, and varnishes over that Circumstance in the best Manner he is able, tho' Sir *Richard* told him at *Guilford*, "that he was convinced the Piece of Bladder was artfully conveyed into the *Vagina*. Then Sir *Richard* further tells us, that warm Disputes arose amongst them, and that Mr. *St. André* urged, that the Delivery of the Bladder was not more surprising than his taking a Rabbet from the *Uterus*"; and our *Narrative* Writer after all the Disputes at *Guilford*, would have the Piece of Bladder pass for a Membrane of the *Placenta*, without taking the least Notice in his *Narrative* of Sir *Richard Maningham's* and Dr. *Hamp's* Suspicions; but goes on farther to tell us, "that she was a second Time disburthened of a Membrane in Structure, Shape, and Size like the former."

The Probity and Veracity of this Affair may be a little more clear'd up by Dr. Hamp's Advertisement of the 13th Instant.

Whereas Mr. St. ANDRÉ *in his* NARRATIVE *lately published of an extraordinary Delivery of Rabbets, has made use of my Name: I do hereby declare that this has been done without my Knowledge and Consent; which I never should have given in a Matter, The Truth of which I did not believe.*

London, Dec. 13, 1726. J. Hamp, M. D.

Our Author concludes his *Narrative* with his hearty Endeavours to asperse Mr. *Ahlers*, who as well as Dr. *Hamp* and Sir *Richard Maningham* (to his Knowledge), had suspected the Fraud even at *Guilford;* and for fear Mr. *Ahlers* should be believ'd, in blasting the Credit of the Imposture, or for some other Reason best known to himself, he publishes the Affidavits of the two *Howards*, of the Patient *Mary Toft*, and of 2 other Women: But as that Gentleman has fully answered them in his Preface and Book, and has gone a good Way towards explaining both Mr. *Howard's* and Mr. *St. André's* Conduct in this pretended Delivery, and in the producing the Affidavits abovemention'd, he has left me the less to say upon these extraordinary Proceedings.

I would have enlarged more upon the Anatomical Part of our Author's Book; but as I found he had taken Pains to misrepresent most of the Parts of his pretended præternatural Rabbets, I must have been under the Necessity of contradicting him almost in every Paragraph; therefore I only chose to single out the most material Mistakes; not doubting but some others of the Profession will contribute their Assistance to expose our Author's Ignorance in Anatomy, or any other Motive that might have induced him to represent Facts in the Manner he has done in the *Narrative*.

But after all, if the Author of the *Narrative* should be really sincere in his intended Recantation, (the coming out of which I own I have some Reason to doubt) I assure him solemnly, that I will assist him, as Leisure may permit, with my Advice *gratis*, that he may perfect the same to the Satisfaction of all Parties. And in the mean time, I shall have the Charity to believe, that he is capable of some sort of Reformation; and shall be very loth to think, like a prejudiced Person, that his *Depositions* Publish'd in the *Gazette* of *Feb.* 23, 1724, and in the *Daily Post* of the 4th of *March* following, are of a Piece with his *Extraordinary Narrative* of the DELIVERY of the Rabbets.

Finis.

P. S. I believe it will not be amiss for Mr. *St. André* to give his Reasons, in his next Book, for refusing to admit Mr. *Gifford*, my self, and several of the Profession, to the pretended Labour of his Patient *Mary Toft.*

Advertisement on the Back of the Title Page of Mr. *St. Andre's Narrative, viz.*

The Account of the Delivery of the Eighteenth Rabbet shall be published by way of Appendix to this Account.

THE SEVERAL DEPOSITIONS, ETC.

The Deposition of Edward Costen.

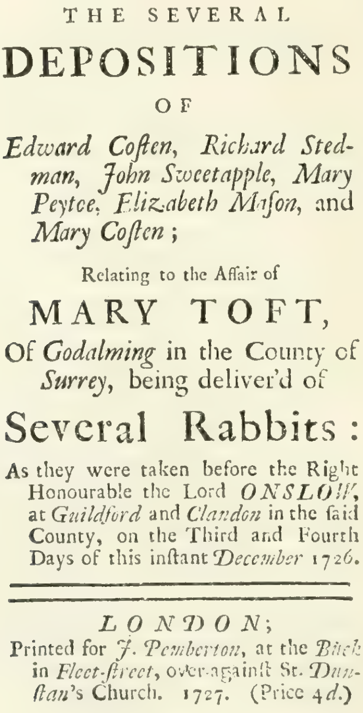
Edward Costen of *Godalming* in the County of *Surrey*, Frame-work-Knitter, maketh Oath, That about one month ago *Joshua Toft* of *Godalming* aforesaid, Clothworker, came to this Deponent and asked him, this Deponent, if he could sell him any Rabbits; and that this Deponent sold him two Rabbits of about a Month old at twice, to wit, one Day next after another, for which this Deponent had of him Three Pence each. And this Deponent further saith, That at the time the said *Joshua Toft* came for the last Rabbit that he had of this Deponent, he asked this Deponent if he had any more; and this Deponent replied, he had one dead, and that it died in the Night: And that then the said *Toft* asked where it was, to which this Deponent said, he had thrown it away: to which the said *Toft* replied, if you had not thrown it away, it would have done as well for me as a live one. Edward Costen.

The Deposition of Richard Stedman.

Richard Stedman of *Godalming* in the County of *Surrey*, Weaver, maketh Oath, That *Joshua Toft* of *Godalming* aforesaid, Clothworker came to this Deponent's House, and enquired for Rabbits; to which this Deponent's Son said he had some, but he thought them too small; to which the said *Toft* replied, small or what they wou'd he must have them; and that this Deponent's Son went and fetched two young Rabbits of about five Weeks old, and he the said *Toft* bought one of them at that time, being *Saturday*, this Day Fortnight; and on the *Monday* then next following, he came and bought the other, and that he killed them each as soon as he bought them in the Presence of this Deponent; and at taking away the first, he the said *Toft* said, you need not let any body know it, for I don't know but I may have occasion for the other; and accordingly had the other for Two-Pence, because it was very poor and small; and this Deponent saith that one of the said Rabbits was black, and the other grey. Richard Stedman.

The Affirmation of John Sweetapple.

John Sweetapple of *Godalming* in the County of *Surrey*, Currier, being one of the Poeple commonly call'd Quakers, solemnly affirmeth, That *Joshua Toft* of *Godalming* aforesaid, Clothworker, came to this Affirmant on the seventh or eighth Day of *October* last, and asked to buy Rabbits; and that this Affirmant then sold him a black Rabbit, above half grown; And that the said *Toft* came again to this Affirmant after his Wife was gone to *Guildford*, and asked this Affirmant if he had any Rabbits; to which he said he had, but they were small: to which the said



THE SEVERAL
DEPOSITIONS
OF
Edward Coſten, *Richard Stedman*, *John Sweetapple*, *Mary Peytoe*, *Elizabeth Maſon*, and *Mary Coſten*;

Relating to the Affair of
MARY TOFT,
Of *Godalming* in the County of *Surrey*, being deliver'd of
Several Rabbits:

As they were taken before the Right Honourable the Lord *ONSLOW*, at *Guildford* and *Clandon* in the ſaid County, on the Third and Fourth Days of this inſtant *December* 1726.

LONDON;
Printed for *J. Pemberton*, at the *Buck* in *Fleet-ſtreet*, over-againſt St. *Dunſtan*'s Church. 1727. (Price 4*d*.)

Fig. 5.

Toft said, he must have them, be what Size they would. And this Affirmant then sold him two Rabbits, one black, and one grey; and this Affirmant took out the Entrails of them before *Toft* took them away. And this Affirmant further saith, That the said *Toft* told this Affirmant, that he was then going to *Guildford* with them.
John Sweetapple.

The Deposition of Mary Peytoe.

Mary Peytoe, the Wife of *John Peytoe* of *Godalming* in the County of *Surrey*, Husbandman, maketh Oath, That *Joshua Toft* of *Godalming* aforesaid, Clothworker, came to this Deponent to buy Rabbits about five Weeks ago, and that this Deponent then sold him one or two of about six or seven Weeks old. And that at several times in about ten Days then next, this Deponent sold the said *Toft* seven or eight Rabbits more of about six or seven Weeks old; and in particular, this Deponent sold him two of the Rabbits, which he killed and paunched in this Deponent's Presence, and said he must carry them to *Guildford:* which said two Rabbits this Deponent so sold him the same Day that the Wife of the said *Joshua Toft* went to reside at *Guildford*. And this Deponent saith, That she gave him one Rabbit of a sandy Colour for his Wife.

The Mark of
Mary × *Peytoe.*

The Deposition of Mrs. Mason.

Mrs. *Mason* maketh Oath, That whilst *Mary Toft* lodg'd at her House, which was about three Weeks, that there was no Rabbits dress'd at her House, or carry'd to *Mary Toft* to eat; and that she heard the said *Mary Toft* say, that she could not eat a Bit of a Rabbit, was she to have a Thousand Pounds for so doing. The Deponent further saith, That *Mary Toft's* Husband had frequent Conference with his Sister, who attended his Wife.

The Mark of
Mrs. *Eliz.* × *Mason.*

The Deposition of Mary Costen.

Mary Costen of *Godalming* in the County of *Surrey*, Widow, maketh Oath, That about a Month ago she was hired to *Mary Toft*, the Wife of *Joshua Toft* of *Gadelming* aforesaid, Cloathworker, as a Nurse, and that she tended her as such till the time she said *Mary Toft* went from *Guildford* to *London;* and that the

Husband of the said *Mary Toft* came often to see his Wife, and that he was often with his own Sister: And this Deponent further saith, That to the best of her knowledge she never saw any Rabbits brought to her the said *Mary Toft* to eat whilst she was at *Guildford*, nor any dress'd in the House, and verily believes there was not any dress'd for or eat by her the said *Mary Toft* during that Time: And further saith, That she, this Deponent herself, saw the said *Mary Toft* delivered of Seven Rabbits of different Colours whilst she was at *Guildford*, all which came from her in several pieces, and not whole: And that this Deponent heard that a black one came from her at *Godalming*. And this Deponent further saith, That as often as the said Husband came to *Guildford*, this Deponent never saw him dejected, or any ways concerned for his Wife's misfortune: And also saith, That during her attending the said *Mary Toft*, she never heard her or her Husband desire that any Minister might be sent for to pray by her: And this Deponent further saith, That she does not know that the said *Mary Toft* was restrained from any Diet at any time whilst she tended her; And that the said *Mary Toft* generally fed on salt Beef and drank sometimes strong Beer, and sometimes small, and sometimes Wine: And this Deponent also saith, That during all the said time she never heard Mr. *John Howard* prescribe any particular Diet for her the said *Mary Toft;* but hath heard the said Mr. *Howard* tell the Poeple that came to see her the said *Mary Toft*, that he did not debar her of eating any thing. And this Deponent further saith, That about nine a-clock this Morning Mr. *Howard's* Apprentice, one Melleish, came to the Gate of *Munsted Farm* in the Parish of *Godalming*, and enquired for this Deponent, and there told her that he had heard from his Master and her Dame, and that the Rabbit was alive Yesterday, and that he had heard my Lord *Onslow* was to send for her, and he would have her stand by the Truth. To which this Deponent said, she would if the King was to send for her, and that she would not do an ill Thing for a Lap-full of Guineas. The Mark of

Mary × Costen.

And this Deponent further saith, That to the best of her remembrance, she never saw the said *Mary Toft* deliver'd of any Guts belonging to the seven Rabbits she saw her deliver'd of as above. The Mark of

Mary × Costen.

871 BEACON STREET.

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

Thirty-eight Annual Meeting, held at Washington, D. C.,
May 6, 7 *and* 8, 1913

The President, HENRY C. COE, M. D., *in the Chair.*

(*Continued.*)

THE CONDUCT OF GYNECOLOGICAL AND OBSTETRICAL OPERATIONS IN THE PRESENCE OF ACUTE AND CHRONIC ENDOCARDITIS.

DR. JOHN OSBORN POLAK of Brooklyn, New York stated that gynecological conditions which demanded operation in patients who were suffering from cardiac disease might be done, provided compensation could be established and the strain of operation minimized. Pronounced secondary anemia from fibroidal disease or other causes had its effect on the heart muscle, producing myocardial and vessel changes. The hepatic and renal functions were consequently disturbed. These might be corrected by tonics, air, diet, transfusion, exercise, etc. The writer had yet to meet a fibroid demanding operation which could not be removed in the presence of cardiac disease. Each case should be studied individually in conjunction with a competent nurse and the cardiac balance reestablished, the liver and renal efficiency restored before operation was undertaken.

The sheet anchor of the preoperative treatment should be rest, with the judicious use of morphia and heart tonics, especially strophanthus and digitalis or its derivatives, the correction of digestive errors, the restriction of fluid until all edema had disappeared, and the careful observance of the blood pressure. He had operated with the hemoglobin as low as 20 and a blood pressure of but 80. This only showed what could be done, not what should be the rule. Expert anesthesia, rapid operating, absolute hemostasis and handling the abdominal viscera as little as possible were the general factors which contributed to success in cardiac cases. Speed and hemostasis diminished the shock, while a small amount of anesthetic and the avoidance of intestinal manipulation prevented distention, paresis and gastric dilatation.

Ether-oxygen vapor given by an expert was the anesthetic of choice. The narcosis should be preceded by morphia, grain 1/4, given one-half hour before beginning the anesthetic. This allowed for perfect oxidation, with a minimum amount of ether. Posture had much to do with embarrassing the respiration and heart action during the operation, which again increased the amount of ether used. A prolonged use of the Trendelenburg position was apt to be associated with cyanosis.

The heart was embarrassed during anesthesia when the patient was in the Trendelenburg position and the blood pressure in the lungs was increased. Forcible pressure upon the abdominal viscera and struggling also produced or interfered with respiration and cyanosis. The last two might be prevented by a properly administered anesthetic, preceded by a sufficient amount of morphine.

When the size of the tumor admitted the vaginal route should be elected, though the peritoneal toilet was never so finished in work done by the vagina. He advised and practised removal of tumors between clamps which was rapid and without blood loss. The main vessels were isolated and ligated individually with fine silk or catgut. All cellular oozing was checked by running the peritoneal edges together, leaving only a smooth peritoneal surface. A dry smooth peritoneum was the best prophylactic against adhesions, infections and ileus.

Cardiac support was given as required by strychnia, strophanthus and digitalis. Morphine was the most dependable, especially in the presence of stenotic lesions, or combinations of them. The cardiac patients got physical and mental repose from morphia, and experience had taught him that most hearts tended to balance themselves if given time.

To summarize his experience in gynecological operations, he concluded: 1. In pelvic conditions necessitating operation, it might be done after proper cardiac preparation; 2. that the cardiac symptoms, blood pressure and the functional activity of the liver and kidneys were the only indices of when it was time to operate; 3. that these cases should always be seen and treated in conjunction with a competent internist; 4. the operation should be rapid, bloodless and done under combined local and general anesthesia, morphine, novocain, ether-oxygen; 5. that the Trendelenburg posture should be used only until such time as the field might be properly isolated, when the patient might be gently lowered out of it; 6. that phlebotomy should be done promptly on signs of right heart engorgement; 7. that postoperative distention must be avoided; 8. that morphia was the mainstay in the therapeutics.

Pregnancy predisposed to an acute exacerbation of chronic endocarditis and distinctly increased the danger of the heart lesion from pulmonary congestion, and subsequent changes in the papillary muscles. This was especially so if the endocardial inflammation was of comparatively recent date, for the establishment of proper compensation in the presence of valvular lesions took time as well as physical and mental rest and this might not be possible to attain before the end of pregnancy.

The writer's experience had taught him to fear heart complications in pregnancy, as the emergencies which arose were many and disquieting. We should never let a patient with heart disease, in whom the compensation had ever been broken, go to full term, as the tax of the last week was usually so great that the margin of reserve was used up. We should never operate during the acute exacerbation. Rest, morphine, strophanthus and digitalis, or some of its derivatives, would balance the circulation if sufficient time and care were given to its reestablishment.

During labor, as long as nature was competent, the patient should have the closest observation, the effect of the pains on the heart should be noted, and the physical suffering of the woman partly relieved by the judicious use of morphine.

The form of interference was determined by certain obstetric findings and the skill of the attendant. First, the relation of the head to the pelvis. Second, the amount of dilatation of the maternal soft parts. Third, the period of pregnancy. Fourth, whether the child was alive or dead, and finally, the actual condition of the mother, as shown by her pulse, blood pressure and peripheral circulation.

Operative procedures, as cervical incisions, forceps, version, pubiotomy, Cesarean section or craniotomy might be done under ether-oxygen anesthesia, where such interference was indicated and necessary, provided the engorgement of the right heart could be properly combatted.

When the intervention had to be made during pregnancy, the condition of the soft parts and the period of pregnancy were the determining factors. In multiparæ with a viable fetus, induction of premature labor, by the introduction of the bag, and leaving the delivery to nature, was the method of choice; while on the other hand in primiparæ, with rigid soft parts, vaginal hysterotomy offered the greatest advantages.

PRESIDENT'S ADDRESS: PATHOLOGY THE BASIS OF GYNECOLOGY.

Dr. Henry C. Coe of New York City stated that uterine pathology, the bugbear of our student days, had been simplified. The expression "chronic inflammation" was regarded with disfavor, as an unscientific term for connective-tissue hyperplasia, which was really an end process. The importance of laceration and erosion as the site of cancer of the portio and the necessary inference that amputation was the only logical treatment had long been firmly established by the microscope. At this time, when our minds were focused on the radical operation, we should not forget in how many thousands of cases the development of malignant disease had unquestionably been prevented by this simple operation. Dr. Emmet himself recently stated to him that the knowledge of this fact afforded him greater satisfaction than all his other contributions to gynecology.

Our knowledge of tubal disease had made rapid strides through the aid of bacteriology.

The etiology and treatment of pelvic suppuration, so familiar to every medical student, were long obscured by the famous pair, pelvic cellulitis and peritonitis. But, however crude may have been the old pathology, we should not forget that the treatment was sound—to incise and drain a pelvic abscess through the vagina. When, with increasing boldness, we began to open the abdomen in acute inflammatory affections, we paid for our experience at a fearful cost. Even the general practice of drainage did not avail and in fact we now knew that probably the majority of the patients who recovered did so in spite of it.

The necessary association of pain of a so-called lancinating character, with internal malignant disease, was an idea so firmly established, that it was difficult to eradicate it from the minds of the general profession, as well as of the laity. How many women with cancer had been allowed to reach the inoperable stage because of the absence of this symptom we dared not conceive.

We were still in the dark as regards the etiology of various pelvic pains, when an opportunity was not afforded by exploratory section to verify our doubtful diagnosis of localized adhesions, twists of pedicles, minor degrees of cystic and other changes in the ovary, etc.

Uterine hemorrhages, especially metrorrhagia, had assumed more importance than ever, in view of the fresh interest awakened in the early diagnosis of malignant disease. Personally he felt that if he could teach his students to properly estimate its significance, to seek intelligently for its cause in every case, and to recognize the indications for surgical treatment, other subjects might be passed over as secondary. That this symptom was often lightly regarded by the general practitioner, who usually adopted the ordinary routine drug treatment, was a matter of daily experience. The advice to explore the uterine cavity with the curet, and to have the tissue examined by a competent pathologist was just beginning to be heeded by the younger generation of medical men. But after we had exhausted the ordinary list of etiological factors, there was still a considerable number of cases of metrorrhagia, especially in healthy girls, for which we could find absolutely no explanation with all our increasing knowledge of uterine and ovarian physiology and pathology. Even in those extreme cases in which after repeated cureting with negative results, the uterus was extirpated, the careful study of serial sections had not thrown much light on the phenomenon. The theory of defective innervation was unsatisfactory.

More intelligent study of the parametria had shown that many cases were rejected as unfavorable when the disease was really confined to the uterus, inflammatory exudate being mistaken for cancerous nodules. The limits of the radical operation had been greatly extended by Wertheim, whose experience and technical skill had enabled him to deal with cases formerly regarded as inoperable.

The question of glandular metastasis was all-important and was still *sub judice*. A considerable percentage of the lymph nodes removed had been found to be healthy. Their extirpation was one of the most difficult steps of the operation and the uncertainty with regard to their involvement was a weak point in a brilliant surgical accomplishment. The anatomical conditions were so different from those in the case of the breast, that we could never expect that the dissection would be as thorough and certain. The question of recurrence was one in which more extended observations were necessary before we could affirm positively how far the element of the infection of raw surfaces with cancer cells affected the prognosis. It was by no means clear why late recurrence occurred as it so often did, in the cicatrix, rather than in the lymph nodes.

We could not be indifferent to the earnest efforts of pathologists to discover the ultimate cause of cancer, and by careful experimentation to find a cure, either a serum, or some metallic compound analogous to salvarsan. It could not be possible that the efforts of the many devoted workers in the laboratory would not eventually be crowned with success. While we pinned our faith at present to surgery, so far from any antagonism existing between the laboratory and the operating room, they were essentially interdependent. We might safely trust the pathologist to discourage the countless cancer cures daily vaunted in the press by which so many sufferers, who might have been relieved by an early operation, were deluded. It would seem as if the pelvic pathologists were in a position to render valuable aid along this line, for in no region of the body were the conditions more favorable for noting the very inception of cancer and studying the course of its invasion of adjacent tissues and metastasis, the late occurrence of the latter being characteristic of uterine disease. It would be a great triumph for us to lead the way not only in the surgery, but in the pathology of malignant diseases.

THE INFLUENCE OF ECTOPIC PREGNANCY ON THE BLOOD SUPPLY OF THE UTERUS WITH SPECIAL REFERENCE TO UTERINE BLEEDING; BASED ON THE STUDY OF TWENTY-FIVE INJECTED UTERI ASSOCIATED WITH ECTOPIC PREGNANCY.

DR. JOHN A. SAMPSON of Albany, New York stated that as a result of ectopic pregnancy the uterus was enlarged, due mainly to hyperemia and a thickening of the endometrium. The changes in the latter were similar to those found in the decidua vera of early uterine pregnancy and apparently due to its arterial invasion from the terminal branches of the radial arteries. The venous spaces of the endometrium were dilated and this dilatation was most marked in the superficial portion of the compact layer and at its junction with the spongy layer. The termination of the pregnancy was followed by involution of the uterus.

The first step in the involution of the endometrium was seen in the greater dilatation of the venous spaces probably due to regressive changes in the stroma and apparently dependent upon a diminished supply of arterial blood. The arteries were less evident during involution of the uterus. The dilatation of the venous spaces was followed by the escape of venous blood in the tissues of the endometrium. If the superficial venous spaces of the compact layer gave way, the blood would escape into the uterine cavity without the formation of a decidual cast. On the other hand, if the venous spaces at the junction of the compact and spongy layer gave way, the extravasation of blood would occur mainly between these two layers and the compact layer would be expelled as a decidual cast.

In time the regressive changes ceased and were followed by a reparative process which was apparently dependent upon the restoration of the arterial supply of the endometrium. The involution following the termination of tubal pregnancy was similar to that following uterine pregnancy, differing only in degree.

In the vast majority of cases of ectopic pregnancy the complete termination of the pregnancy was a gradual process often taking several days or weeks (four weeks or more in seventeen of the twenty-five cases studied.) When operated upon the uterus had been and may still receive stimuli from two distinct antagonistic sources, pregnancy and involution. The condition present in any case depended upon which of these forces predominated and to what extent it had been and was influenced by the other.

The uterine bleeding was of venous origin from the venous plexus of the endometrium due to regressive changes in the latter apparently dependent upon a diminished arterial supply (muscular insufficiency might also contribute to this). The bleeding continued as long as the pregnancy (products of conception) interfered with the process of involution; it was probably analagous to the bleeding in subinvolution of the uterus due to an incomplete uterine abortion.

DISCUSSION ON THE PAPERS OF DRS. POLAK AND SAMPSON.

DR. PHILANDER A. HARRIS of Patterson, N. J. said that to one who had performed a good many operations for ectopic gestation, to be specific, 228, it was interesting to have this unquestionable demonstration of the changes which occurred in the uterus. It would not have been possible for him to have exhibited uteri from the cases on which he had operated for ectopic gestation, excepting those uteri that were also the seat of some neoplasm or fibroid of some kind. This brought up the question of what practical use was the uterus after operating upon a patient for a single gestation? Dr. Smith, a member of the society, collected a good deal of information along this line, and he hoped he might be pardoned for saying that he had not had time to find out how many women in the 228 operations for ectopic gestation really gave birth to children, but according to Dr. Smith and others the number was exceedingly small. Very often only four or five women who, after being operated for ectopic gestation, gave birth to a child. Possibly there were four out of the 228 on whom he had operated. In thirteen of this number, the ectopic gestation was recurrent. The only point that came to his mind now was whether, in order to secure only four or five offsprings in possibly 228 cases, we should save the uterus, and not sacrifice menstruation for the little interest in future offsprings.

Dr. Hiram N. Vineberg of New York City asked Dr. Sampson how he would explain those cases of uterine hemorrhages, so far as the symptoms went, that had occurred before the termination of pregnancy? The first symptom might be uterine hemorrhage. Perhaps a day or two later a woman might have an abdominal cramp, showing that tubal gestation had taken place.

Dr. Sampson, in closing the discussion stated that in eleven cases of the series the uterus was retained when the opposite tube was examined, because the women desired to have children. In every case he talked over the possibility of children before operating. He had followed the future history of these eleven cases; five of them had not become pregnant, although in two of them only two months had elapsed since the operation. Two had borne children, one two and the other one, and the one who had one child subsequently had tubal pregnancy on the opposite side. Three had had miscarriages, although they claimed they desired to have children. One had three miscarriages and the other two had one each. Another, the sixth one, had tubal pregnancy in the opposite side, making two cases of repeated tubal pregnancy in the eleven cases in which at the time of operation the tube, which was the seat of a second ectopic gestation, was apparently normal, and which was retained with the hope that the woman would have a child subsequently. He had encountered two other cases of repeated ectopic pregnancy in which the first operation was done by another operator, so that he did not know the condition of the tube at that time. He was perfectly willing to preserve the tube and the possibility of future conception in every patient who desired to have children. On the other hand, if he found the opposite tube was diseased, and especially if a number of these women were fairly well advanced in years, that is thirty-five to forty, and had had their share of children, he thought we should in every way make these patients just as well as we possibly could for the rest of their lives, and save them all future trouble. He could see very little use in leaving behind a uterus which was the seat of inflammatory trouble or adhesions about it as the result of operation if it was only going to cause trouble.

In regard to bleeding without pain, all but one of these patients gave a history of uterine bleeding at some time during the illness. In one case the bleeding preceded the pain for three or four weeks, and he could not account for it except probably there was the beginning of the termination of pregnancy in which the bleeding between the gestation sac and the wall of the tube was not sufficient to give rise to any serious symptoms.

In regard to preserving the ovaries, in nearly every instance one ovary was preserved.

AN OPERATION FOR THE CURE OF RECTOCELE AND RESTORATION OF THE FUNCTION OF THE PELVIC FLOOR.

Dr. George Gray Ward, Jr., of New York City, after describing the methods in vogue, stated that in the operation as practised by him, a buttonhole was made in each vaginal sulcus by passing a pair of closed scissors through the fascia or cicatricial tissue which had replaced it. This opened into the fossa in which lay the levator, the anterior edges of which were drawn out of the buttonhole with a forceps, and they were sutured together in the median line.

The approximation of the anterior borders of the levator ani had been criticized, as producing a weak support, owing to the fact that muscle applied to muscle would not make a firm union. To give the necessary fascial support to this muscular union and thus overcome this criticism, he carefully sutured the edges of the opposite fascial buttonholes together over the approximated levator fibers. The results of this procedure had been most satisfactory, as to the restoration of function, when used alone in cases without rectocele, and when combined with the rectocele operation.

Technic.—The labia minora were first drawn aside and sutured to the skin, and a folded sterile towel to the perineum just above the anus. A gauze sponge on a sponge holder was inserted in the rectum as a guide. Short bullet forceps were caught at each posterior caruncle immediately below the orifices of Bartholini's glands, care being taken not to occlude them. A third forceps was attached to the posterior vaginal wall in the median line, marking the crest of the rectocele. Traction was made on these tenacula and the resulting triangle was outlined with a scalpel. This triangle represented the excess vaginal wall which was to be subsequently removed. Marking its boundaries at the outset greatly facilitated its accurate removal a at later stage.

With blunt-pointed scissors, the base of the triangle was dissected from side to side, and the separation of the posterior vaginal wall from the rectum was carried upward by inserting the blades of the scissors in the line of cleavage and opening them widely. Very little cutting was necessary, and the sponge in the rectum, the handle of which may rest on the operator's knee, made a live guide as to the path of safety. The vaginal wall was completely separated from side to side as high up as the culdesac of Douglas.

The rectum having been completely mobilized, a catgut suture was passed through the vaginal wall in the median line as high up as possible in the region of the cervix. This suture was brought down and made to catch up the rectal pouch about its center, and was then carried up and made to emerge through the vaginal wall in close proximity to its original insertion. When this suture was drawn up and tied, it obviously carried the dilated rectum up with it far beyond the limit of the subsequent resection of the vaginal wall.

It thus approximated the denuded rectal pouch to the upper third of the vagina, which was above the site of the rectocele.

The rectocele having been disposed of, the excess vaginal wall which entered into the formation of the rectocele was cut away along the lines marked out with the scalpel at the commencement of the operation, and the cut vaginal edges were then sutured together with catgut. A pair of closed scissors was then passed through the fascia in the vaginal sulcus. They were opened widely, and withdrawn, thus making a large buttonhole which opened into the space in which lay the levator. The index finger located the anterior portion of the levator and the muscle was caught with a pair of sponge forceps and drawn out of the buttonhole. The opposite muscle was secured in the same manner, and they were sutured together in the median line with chromic catgut. The effect of this was immediately apparent, the shortening of the muscles lifting up the relaxed pelvic floor.

The outer edges of the fascial buttonholes were next sutured together over the approximating muscles with catgut. This step the writer laid stress upon as an important factor in giving these muscles a fascial support. The operation was then completed by passing three silkworm-gut sutures from the skin surface behind the entire muscular approximation. These were tied, and they were the only sutures appearing externally. Their purpose was to give strength, thus allowing the use of finer catgut for buried sutures, and should there be a failure of primary union they would hold the tissues together sufficiently to give a fair chance of a satisfactory result by granulation.

THE RELATION BETWEEN THE BLOOD PRESSURE AND THE PROGNOSIS IN ABDOMINAL OPERATIONS.

DR. GEORGE W. CRILE, of Cleveland, Ohio, said that in considering the advisability of operation upon a patient with hypertension we should find that while at times the hazard must be taken at once, at times also, operation might be delayed until the hypertension hazard had been eliminated, or to some extent at least diminished. If a patient with a benign tumor was in the throes of an overwhelming grief, or if he was passing through a psychic strain —the result of intense worry or anxiety—the operation might well be delayed until the emotional stress was passed. A benign tumor in a patient with Graves' disease might safely await a lobectomy or ligation, and the after-cure of the dominant trouble. If the hypertension was due to a pyogenic infection, the operation for a chronic disease might be delayed until the focus had been eradicated. Again, operation for benign tumors or chronic diseases might await the most favorable phase of that form of hypertension which could be partially controlled by nitroglycerin, meat-free diet, rest and diversion.

The natural sequelæ in hypertension cases were embolism, thrombosis, renal insufficiency, angina, pneumonia, cardiac failure. Why were these dangers precipitated by operation? They knew that some of these results were to be expected when a person whose blood pressure was high was subjected to undue mental or physical exertion; to sudden shock, either physical or psychic; or to heavy nervous strain. From such cases a heavy toll of life was levied at seasons of great stress, such as financial panics, the San Francisco earthquake, the recent Ohio floods, etc.

We knew by constant clinical experience that any emotional excitation would drive the whole motor mechanism, even though no muscular act was performed. The brain, the thyroid, the adrenals, the liver, the hypophysis—all the parts of the body that contributed to fight or to flight—were activated. The reason was clear: In our phylogenetic history those causes which produced fear or anger or any form of emotional excitement at once led to great bodily activity. The individual put his entire motor mechanism into use by either running away from danger or by aggressively fighting against it. As the human race developed and civilization advanced man learned to control the outward expression of his emotions, but it was still impossible for him to control the activities of the mechanism itself. By his very repression he increased the danger of too great activity, for the energy which formerly would have been expended in motion accumulated within the mechanism itself until the danger point was reached and passed. Right here was found the key to the cause of damage in cases of hypertension, for among the energizing substances thrown into the blood stream to increase the power of motion, were adrenalin, the secretions of the thyroid and of the hypophysis, and glycogen. As there was no muscular action, none of these was consumed, while the body was shaken and damaged as was the stationary automobile whose engine was running at full speed. Besides causing needless activation, all these energizing substances must be eliminated and so an unusual strain was put upon the organs of elimination.

This reasoning was based, not only upon clinical observations, but also upon laboratory experimentation, by means of which (1) he had proven conclusively that the emotions caused as great activation of the brain as did physical injury or physical exertion, and (2) he not only had confirmed Cannon's observation that emotion in cats caused an increased output of adrenalin, but he had added the significant fact that if the nerve supply of the adrenals was divided there was no increase of the adrenal output.

The significance of these two conclusions became obvious at once when we recalled the rich nerve supply of the ductless glands, the physical evidences of brain stimulation, and the definite proof that the brain controlled the adrenal output.

The significance of the increased adrenal output was obvious when we remembered that adrenalin specifically stimulated the blood-vessel walls, raised the blood pressure, and increased the output of glycogen by the liver.

And in turn the significance of the increased glycogen output was obvious when we recalled the physiologic fact that glycogen bore the same relation to the running of the human motor that gasoline bore to the running of an automobile.

From these studies, clinical observations, and laboratory experiments, therefore, he had arrived at a simple explanation of disastrous effects of emotional stimulation upon a patient with hypertension. He had established also another point which bore directly upon our problem of successful operation upon those handicapped patients. In experiments upon animals he found that the adrenal output was not increased by any amount of *physical* injury, that is, the emotions had exclusive control over those ductless glands whose function was to increase motor activation. They saw, then, that the emotional factor assumed an increasingly important rôle in the performance of surgical operations. The elimination of the emotional factor--important always—was essential to the successful outcome of operations upon those cases whose margin of safety was narrow at the best.

Hypertension increased the gravity of the prognosis in operative cases unless in some way those adverse factors could be controlled. Happily, this end could be reached by operative methods which he would describe after a brief discussion of the relation of hypertension to the prognosis.

It might at first seem unwarranted to state that he could often give a more favorable prognosis in the case of a patient with hypotension than in one with hypertension. That he could do so was due to the fact that for this condition he had a definite and efficient remedy. As the principal causes of hypertension were hemorrhages and anemia, the condition was logically to be met by the direct transfusion of blood, which as occasion demanded, might be done several days before, just before or during the operation, or immediately thereafter.

Before proceeding to a description of the technic employed in abdominal operations, he said a word regarding the reasons for making nitrous oxide our anesthetic of choice. He had already mentioned the special dangers of ether in the class of cases he was considering. These objections led him to turn to nitrous oxide, an anesthetic pleasant to take, devoid of baneful after-results, and serving as a measurable protection against shock, because as experiments had shown, by its hindrance to oxidation nitrous oxide diminished the changes in the brain cells, which were otherwise caused by the traumatic stimulation incident to the operation.

The complete technic in abdominal operations was as follows: When the preoperative strain was great, an hour or so before the operation he administered to the patient a hypodermic injection of 1/6 grain of morphia and 1/150 grain of scopolamine, that he might receive solace and quiet which came from the use of these drugs. The inhalation anesthetic might be administered in the patient s room; or else in the apathetic state produced by the morphia and scopolamine, the patient with eyes and ears closed to external impressions, was conveyed to the operating room where a specially trained anesthetist administered nitrous oxide. When the patient was anesthetized the division of tissue was preceded by nerve blocking by means of the local administration of 1/400 novocain. Each division of tissue in the course of the operation was preceded by the infiltration of this local anesthetic, the blocking being made so complete that no nerve was left free to carry a single activating impulse to the brain. First the skin, therefore, then the subcutaneous tissue, then the fascia, and finally the remaining muscle or posterior sheath and the peritoneum were in turn novocainized, subjected to momentary pressure to spread the anesthetic, and then divided within the blocked zone. If the blocking had been complete, then upon opening the abdomen there would be found no increased intraabdominal pressure, no tendency to expulsion of the intestines, and no muscular rigidity.

The peritoneum was next everted and a 1/2 per cent. solution of quinine and urea hydrochloride was infiltrated about the line of proposed sutures, and as before the parts were then subjected to momentary pressure. This infiltration served as a block and as its effects lasted for several days, it would prevent or at least minimize the postoperative wound pain and the postoperative gas pain, and by so much minimize postoperative shock. Quinine and urea caused a certain amount of edema of tissue which lasted for some time after the wound had healed.

The relaxed abdominal wall would permit exploration of the entire abdominal cavity with ease. If there was no cancer nor acute infection in the field of operation, then the following regions might be blocked as completely and in the same manner as the abdominal wall; the mesoappendix, the base of the gall bladder, the uterus, the broad ligaments and the round ligaments, the mesentery and any portion of the peritoneum. After a hysterectomy the stumps might be completely infiltrated with quinine and urea hydrochloride, thus giving a degree of anesthesia for at least two days. On account of the absence of nociceptors, operations on the stomach and intestines made without pulling on their attachment caused no pain, and hence the novocain infiltration of these viscera was not required. If the brain had received no stimuli during the operation, then the closure of the upper abdomen was as easy as the closure of the lower—all was done with the ease of relaxation. What was the result? No matter how extensive the operation, no matter how weak the patient, no matter what part was involved, if *anoci* technic was perfectly carried out the pulse rate at the end of the operation was the same as at the beginning. The postoperative rise of temperature, the acceleration of the pulse, the pain, the nausea and the distension were minimized or wholly prevented.

As to the mortality control—last year his associate Dr. W. E. Lower and he performed 729 abdominal sections of every grade with a mortality rate of 1.7 per cent. and in the Lakeside Hospital service where all kinds of acute emergencies were met, and where most of his own private work was done, there were performed by his associates and him in the past year, operations on 2,672 patients with a mortality rate of 1.9 per cent.—a result never before approached in the Lakeside Hospital. In the last 1,000 operations performed by his associate Dr. W. E. Lower and himself—these operations including every risk of a general surgical practice—the mortality rate had been 0.8 per cent.

STUDIES IN BLOOD PRESSURE BEFORE, DURING AND AFTER OPERATIONS UNDER LOCAL AND GENERAL ANESTHESIA.

DR. JOSEPH C. BLOODGOOD of Baltimore stated that even to-day, with better anesthesia, with better technic, there was a mortality following operations. The mortality was not from a simple appendectomy and from other simple operations, but it was from the graver operations, such as resection of the stomach, resection of the colon, the more extensive operation for cancer of the uterus, and the more difficult operation for myoma of the uterus. There was a mortality, and if there was an autopsy on such a patient, one would find no infection of the wound, no break in the technic of the intestinal suture, no hemorrhage from the pelvic operation, but still the patient died. Carefully followed, these patients died as a rule within forty-eight hours or three days with a gradual lowering of blood pressure, with a gradually increasing pulse, with little or no fever, or they died of complications, which in the healthy individual were not serious. Patients died from complications of the kidney, such as anuria, complications of the heart, complications of the stomach, such as dilatation. There was this mortality in surgery to-day, which had no relation to infection and no relation to faults in technic in the sense of hemorrhage, in the sense of faulty suture of intestine where there would be peritonitis, in the sense of incorrectness which would produce intestinal obstruction, but in the sense of death and shock, or death from complications that were due to the shock of the operation. These complications were chiefly dilatation of the heart, dilatation of the stomach, and faulty kidney function.

In the last four or five years, due to the investigation of the literature on the subject, and stimulated by Dr. Crile's work in the laboratory and clinic, he had attempted to follow his technic, and he thought the most practical thing he could say was to follow Crile's technic in every case. It must be remembered, however, that to accomplish something that was difficult, something that was more than ordinary, one must practise, practise. From his experience now covering three years, if one wished to develop the technic of anesthesia and operation and to give these handicapped patients with an extraordinary operation the best opportunities for recovery, one must practise this newer technic in every case until he had fully developed it.

THE DIAGNOSTIC VALUE OF THE ELECTROCARDIOGRAPH BEFORE GYNECOLOGICAL AND OBSTETRIC OPERATIONS.

DR. HUGO H. FREUND of Detroit, Michigan, gave a short description of this instrument and described the various waves. He spoke of the application of the electrocardiograph to hospital cases, especially those in which the patient's cardiac condition was in doubt. He showed lantern slides demonstrating the various forms of cardiac irregularities as recorded with the electrocardiograph. The advantage of this form of graphic work over that of clinical bedside examination and over certain forms of sphygmographic tracings was discussed. Some stress was laid upon the type of electrocardiogram that called for operative interference in pregnant women.

DISCUSSION.

Dr. George Dock of St. Louis, Missouri, said he had had no experience with the use of the electrocardiograph, but the fact that he was invited to open this discussion was due to the long experience he had had with Dr. Peterson, and he was sure that no one regretted the absence of Dr. Peterson more than he did. Dr. Peterson and the speaker became interested in the value of careful heart studies by the older methods. In a great many important cases it was found possible to show that by a more careful examination of the heart than by the mere feeling of the pulse and listening to the heart, and especially by a study of the tracings from the radial pulse and jugular and other parts of the vascular system, they were able to say more positively that certain cases of heart anomaly were safe for operation or absolutely bad from the standpoint of permanent recovery. Dr. Peterson had formed an opinion of the value of this work, and the speaker himself suggested that Dr. Freund apply the electrocardiograph to the study of these cases, as that was the logical thing to do.

As Dr. Freund had pointed out, the electrocardiograph did not replace other methods of examination, but gave more scientific information regarding the condition of the heart, and especially of the heart muscle, that could not be obtained in any other way.

Dr. J. Clarence Webster of Chicago stated that shortly after he became a fellow of the society, now fourteen years ago, he began to use local anesthesia tentatively following Reclus of Paris. He did not do very much with it. Then when the Schleich solution came in, he adopted that, finally sticking to No. 2 for infiltration purposes, using that method in certain cases. For the last two years he had used very largely local anesthesia in all kinds of work in the pelvis and abdomen, major and minor, local anesthesia alone or in combination with ether, and in recent years in combination with gas and oxygen. He had preached in Chicago these methods of anesthesia, but very few surgeons had adopted the procedure. One could absolutely say with certainty that if 100 operators were selected on one side and 100 on the other, if given the same run of cases provided their technical skill was the same and all conditions were the same except the anesthesia, after a period of six months or one year or longer, those who used local anesthesia partially or entirely would have a finer record both as regards mortality and morbidity than those who used general anesthesia. The greater safety during operation, the greater ease and lessened risk after operation, were evident without any deep investigation.

Dr. Bloodgood, in closing the discussion, said that in his work he had anesthetic charts which were kept by the senior nurse under the direction of the assistant surgeon who was giving the anesthetic, and the operator dictated in the right hand column what he was doing, the incision made, or whatever manipulation he was doing. This was charted with the condition of the pulse and blood pressure. On the left hand side of the column, the anesthetist said to the nurse the patient was quiet or cyanotic, or whatever was happening was recorded. He had to give a drop or two of ether where he could not have painless manipulation. By means of this chart the surgeon and anesthetist worked together, and that in developing the clinic one could do so to much better advantage both to the surgeon and anesthetist. He looked upon anesthesia as the stepping stone to surgery. Nurses were taught how to make blood pressure records before and after operation. The blood pressure records in the operating room were checked by the nurse in the ward. This had a good effect upon the patients.

THE CONDUCT OF PREGNANCY AND LABOR IN ACUTE AND CHRONIC AFFECTIONS OF THE HEART.

Dr. J. Clarence Webster of Chicago stated that acute cardiac affections were rare in pregnancy and must be regarded as very serious. In the early months the patient should be kept at rest and be treated medically. After a few weeks of improvement the uterus should be emptied. It would be very advisable to allow the pregnancy to advance until viability of the fetus, because of the small likelihood of having a healthy heart muscle or well-established compensation. The risk of pulmonary edema and over-dilatation of the right side of the heart would be very great. The induction of abortion at the onset of acute disease should not be considered because of the extra strain which would be thrown on the heart.

We were far more frequently consulted in regard to pregnancy occurring in women with old cardiac disease. In the interests of the mother, he believed that the best advice in such cases was that pregnancy should not be allowed to occur, and that if it had taken place, it should be terminated.

If anemia or poor health from other causes existed, the cardiac trouble would likely be aggravated. In vegetative endocarditis, fresh fibrin deposits might form on the diseased valve from the increased hyperinosemia of the blood of the pregnant woman.

Abnormal size of the uterus due to a large fetus, twins, or excessive liquor amnii increased the strain. Disorders of the alimentary tract by causing abdominal distention or by causing toxemia might have a bad effect on the heart muscle. In some cases the heart bore up so well under the extra strain and risks of pregnancy that the patient might be disturbed no more than under normal conditions. Moreover, this experience might be repeated in excessive pregnancies. These cases were, however, the exception.

It was a safe generalization that a woman with a definite chronic lesion, namely, valvular or myocardial degeneration (he was not referring to cases diagnosed as such simply because a functional or temporary murmur was heard), had *cæteris paribus* a shorter life expectancy if she passed through pregnancy and labor than if she did not, and the risk was increased in proportion to the frequency of the pregnancies.

The most serious cases were those in which the myocardium was degenerated tending to cause cardiac dilatation, or in which after former valvular disease compensation had not been thoroughly established.

If signs of cardiac failure, namely, dyspnea, palpitation, edema, cough, etc., developed without signs of premature emptying of the uterus, he believed it was best to keep the patient in bed on treatment calculated to improve the heart, waiting for a period of improvement to again advise artificial termination of the gestation. If no improvement occurred and marked signs of cardiac failure developed, the patient's condition was desperate whether the uterus be emptied or not.

Surgical procedures should be avoided in active or recent valvular disease, dilatation, or myocardial degeneration except in conditions of extreme emergency. General anesthesia might greatly increase the risk by causing straining, coughing, vomiting, respiratory embarrassment and asphyxiation. If there be orthopnea, the patient should be semirecumbent, and chloroform should never be employed. Ether was generally advisable, except when there was pulmonary edema or bronchitis. Pure nitrous oxide was contraindicated. If it be administered with oxygen, it was one of the safest anesthetics in such cases.

He had performed various minor and major operations in incompensated valvular disease with local infiltration anesthesia, using Schleich solution No. 2 or novocain (1 in 200) without untoward results. Among these had been abdominal and vaginal Cesarean section, resection of the gut in strangulated hernia, and drainage of infected gallbladder. In some instances he had combined the local anesthesia with gas and oxygen administration. The Trendelenburg position should never be used where heart disease existed unless compensation was good and circulatory and respiratory conditions were satisfactory. When employed, it should be very gradually established and only to a moderate extent. Too sudden lowering of the patient's chest was apt to embarrass the right side of the heart. Forcible pressing of the viscera toward the diaphragm with packs must be avoided because of mechanical interference with the diaphragm and of forcing blood from the abdominal veins to the right heart, thereby putting additional strain on the latter.

DISCUSSION.

Dr. T. J. Watkins of Chicago stated that one thing that impressed very many practitioners was the fact that most cases with valvular lesions took an anesthetic well. Patients were frequently operated on with valvular lesions with a great deal of trepidation, and it was a very uncommon experience to have difficulty with such cases.

In regard to the anesthetic used, it seemed to him we overlooked to a large extent the personal element in the selection of the anesthetic, and he was very much impressed that the best anesthetic was usually that one that the man giving it was most accustomed to using. For instance, gas and oxygen anesthesia was a bad anesthetic for the inexperienced anesthetizer, while ether anesthesia was excellent for a man who had given it a number of times. He felt very firmly convinced that the personal element of the anesthetizer was equally as important as the selection of the anesthetic.

Dr. Edward P. Davis of Philadelphia said he had been especially interested in heart lesions complicating gestation, and to his mind mistakes in diagnosis in heart cases in pregnancy were by no means uncommon. Murmurs in pregnancy were very common, and usually of hemic origin sometimes, owing to toxemia, sometimes to anemia, sometimes to conditions in the uterus which greatly disturbed the circulation. In his experience the most valuable sign of mitral stenosis was one that Von Jaksch of Vienna taught us years ago, namely, if one took the stethoscope and elicited an auricular sound with contraction, and then with the finger upon the radial artery could detect an interval between the two, he could make a diagnosis of mitral stenosis positively. This had done him good service since the days of Billings and other men, so that he would rely upon that very largely for the diagnosis of mitral stenosis rather than upon a murmur.

An important thing was the condition of the heart muscle, and this one must appreciate by the blood pressure, by study of the artery under the finger, and study of the patient's excretions, for we all knew to our sorrow how some cases of toxemia went wrong in a cardiac way, and if there was pronounced toxemia we should become fearful as to the condition of the heart muscle.

In interfering with pregnancy complicated by heart lesion, the decision in his experience should be made upon no one symptom, but upon the general condition of the patient, the condition of the heart muscle that was to be apprehended, and then, of course, the wishes of the woman should be respected. If she desired offspring and was willing to take the risk, we should accede to her wishes; otherwise we might allow the interruption of gestation. When this was to be done he thought the simple rupture of the membranes was usually the best procedure rather than forcible dilatation, and if there was a long resistent cervix, then would come notably the advantages of vaginal Cesarean section, for it must be one of two things; it must be a gradual interruption of gestation with so little distress as not to disturb the patient in the least; she should be kept comfortable under digitalin, codein or morphine, or it must be the rapid cut of the surgeon. Interference with the uterus and dilatation with bag and manipulation were greatly to be deprecated.

When blood pressure was reduced too suddenly conditions were favorable for pulmonary embolism and thrombosis and for permanent dilatation of the chambers of the heart, so that in those cases he would precede the incision and emptying of the uterus by strychnia and digitalin, and under no circumstances should ergot be used, for he thought it was contraindicated in all cardiac lesions.

Dr. J. Clarence Webster of Chicago asked Dr. Davis as to his belief with regard to allowing pregnancy to occur. The reason why he asked the question was this: Dr. Hirst had rather given the impression that he had had such a favorable experience in cases of pregnancy and labor with heart disease that he was inclined to minimize rather than magnify its seriousness. Dr. Hirst had led him to believe that practitioners could safely advise women who were newly married, with chronic heart lesion, to go on with pregnancy. The speaker had taken the position that in a case of definite lesion of the heart—and he was not referring to tumor or functional murmurs, which he believed may have been diagnosed as due to serious disease either of the valves or of the myocardium —that the correct advice to give a woman, if she married, was that she should not become pregnant, and that if she became pregnant it was not wise to allow it to go on. He would like to hear from Dr. Davis and others as to their attitude and advice to give in these cases.

Dr. Edward P. Davis of Philadelphia said he was distinctly conservative on that question. A woman, who had a well defined, clearly diagnosticated, important cardiac lesion, married at the risk of her life, and he believed that marriage must imply the possibility of conception, for he knew of no method of absolutely preventing conception, provided sexual intercourse had occurred.

Dr. Charles M. Green of Boston said that what went out from the society influenced the general practitioner. It seemed to him that there was a rapidly increasing tendency on the part of practitioners to abort women on slight pretenses, without due study of the cases and without due care. Dr. Webster mentioned functional diseases, mitral disease, and endocarditis proceeding from rheumatism, etc. If the practitioner had the patience to work on these women when they became pregnant they could be pulled through. He desired to report one case which recently came under his observation. A woman was sent to the hospital to be aborted because the general practitioner had treated her in her own home and had failed to restore compensation. When she was admitted to the hospital she was within one month of term. She was cyanotic, could not breathe lying down at first, and did not have any edema. But she passed a month in all on rest treatment and general medical treatment, and she arrived at term, and it was his intention to allow her to come to term, if possible, dilate, and deliver without subjecting the woman to any muscular strain. About a week before full term she was able to sit up and got out of bed the following day. Labor came on and was so easy that they had to hurry to receive the baby. She went through labor without any offset to the heart. She had a healthy child, she was able to nurse the baby, and went out of the hospital in due time perfectly well.

ANEMIA AS AN OPERATIVE RISK.

Dr. Henry T. Byford of Chicago divided anemia into two kinds, namely, anemia with compensation and those without compensation.

Anemia with compensation included those cases that had acquired the resisting powers of a normal individual. The hemoglobin percentage might be quite low, below 50, but the erythrocyte count was usually above 4,000,000.

The characteristics were (1) the anemia had lasted long enough for an adjustment of the functions to the anemic state; (2) the patient was able to perform the duties of a moderately active life with comfort, (3) the muscular development was good, (4) there was an absence of marked emaciation, (5) the blood pressure was good and the pulse of normal frequency during resting periods, (6) the anemia responded slowly to treatment since an anemic habit had been required.

They took anesthetics well, stood major operations well unless there was great loss of blood, and recovered promptly from states of great depression.

Anemia without compensation were cases who were unable to endure hard work, had poor muscular development, were under weight, and usually had a low blood pressure and rapid pulse.

Several varieties were mentioned, those with chronic sepsis, those bedridden by functional disorders, those subjected to continuous depressing influences or overwork, those of recent occurrence and rapid supervention, those of the early stages of convalescence from serious attacks of disease and those connected with serious chronic, or progressive incurable diseases.

In estimating a patient's resisting power, attention should be called to the number and character of the erythrocytes as well as the hemoglobin percentage. In a general way it might be said that the compensated cases stood operations better than the blood pictures would indicate, while the uncompensated cases did not stand them as well as it would indicate.

OPERATIONS ON PATIENTS WITH A HEMOGLOBIN OF 40 PER CENT. OR LESS.

Dr. Thomas S. Cullen of Baltimore examined the cases from the Gynecological Department of the Johns Hopkins Hospital from 1889 to 1912 and found about 170 cases in which the hemoglobin was 40 per cent. or below.

CAUSES OF THE LOW HEMOGLOBIN IN THE PATIENTS THAT RECOVERED.

Uterine myomata were responsible for the low hemoglobin in forty-two cases. Hyperplasia of the endometrium in twenty-three cases. By hyperplasia of the endometrium he meant a mucous membrane that had an intact surface epithelium occasionally with slight polypoid outgrowths, very small glands in places and exceedingly large ones in others. In addition the stroma of the mucosa was very dense and contained in some instances a large number of nuclear figures. The veins in the stroma of the mucosa were often dilated and frequently contained thrombi. He considered this a definite disease in itself. It usually occurred in women of the child-bearing period, but had in a few instances been found in young girls. It was temporarily controlled by curetage. In many instances in the end it was necessary to do a supravaginal hysterectomy before relief took place.

Squamous cell carcinoma of the cervix was responsible for the low hemoglobin in eighteen cases; pelvic inflammation in thirteen cases; retained placenta in thirteen cases; tubal pregnancy in thirteen of the successful cases; adenomyoma of the uterus in seven cases; chorioepithelioma in two cases.

Among the other causes of the low hemoglobin he mentioned hemorrhoids, general peritoneal carcinosis, adenocarcinoma of the uterus, prolapsed rectum, etc.

In 153 cases where patients recovered there were

49 cases between 40 and 36 per cent. inclusive.
30 cases between 35 and 31 per cent. inclusive.
29 cases between 30 and 26 per cent. inclusive.
30 cases between 25 and 20 per cent. inclusive.
14 cases below 20 per cent.

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OPERATIONS ON PATIENTS WITH A HEMOGLOBIN BELOW 30 PER CENT.

Dr. Cullen gave the results of operations on a large number of cases where the hemoglobin was below 30 per cent. The operations performed were curetage, vaginal removal of submucous myomata, exploratory laparotomy, removal of one or both appendages and hysterectomy, vaginal or abdominal. He then gave in detail the histories of patients with such a low hemoglobin that operation could not be undertaken, patients dying in the hospital. Finally he reported a series of cases with low hemoglobin where the patients died after operation. His deductions were as follows:

From the foregoing it was clearly evident that as a rule patients with a relatively low hemoglobin stood pelvic or abdominal operations fairly well. Where carcinoma of the cervix or body of the uterus existed, however, the dangers were materially increased.

In those cases where the bleeding was limited entirely to the menstrual period it was well to defer operation until a few days before the next period, thus raising the percentage of hemoglobin to the maximum.

Hyperplasia of the endometrium was a definite disease. The bleeding caused by this condition often led to a low hemoglobin index which could be temporarily checked by cureting. Sometimes after two or three curetings in the course of a year the excessive flow ceased, in other cases it was necessary to remove the body of the uterus.

He could not impress too strongly upon the members of this society the necessity of their becoming thoroughly familiar with the technic of transfusion. This procedure as simplified by Bernheim could be readily employed by any surgeon and should not require more than twenty minutes to half an hour. Transfusion would certainly in the near future become a routine procedure in cases where operations were required on patients with a very low hemoglobin. It was hardly necessary to draw attention to the inadvisability of employing any but the mildest cathartics after operation on such patients. He recently heard of a patient who, notwithstanding a hemoglobin below 20 per cent., weathered a severe abdominal operation. A day or two afterward she was given calomel and salts and promptly died. The after-treatment of these cases required the greatest care coupled with the avoidance of anything that would in the least measure diminish the patient's strength.

DISCUSSION.

Dr. J. Wesley Bovee of Washington, D. C., stated that he had avoided operating on patients in whom the hemoglobin percentage was under 40. He had in each case fortunately been able to build up the patient after operation, especially cases of ectopic pregnancy, until he got the hemoglobin percentage above 40. He had particularly noticed this in the bleeding from submucous fibroids, and he felt he had a remedy for that class of cases which had proved quite satisfactory to him. In carrying out his work with it he took good care not to employ remedies, such as iron and other agents that were used for blood building, so as to limit his observation as far as he could to the one remedy, which was giving each day a quart of normal salt solution by rectum, morning and night. This he had carried on for ten or twelve years, with fair diet and rest in bed, and if there was bleeding or menorrhagia, he packed the uterus if the bleeding was considerable, until danger from that source had gone, limiting it as much as possible. He believed that these cases with low hemoglobin percentage were not good operative risks. He felt they were much poorer risks than those with a higher hemoglobin percentage, and he was glad Dr. Cullen had been so fortunate with his cases with the hemoglobin percentage down as low as 25, 15 and so on. He recalled one woman in whom the hemoglobin was down to 11 per cent., and in whose case he succeeded in about four weeks in bringing it up to over 50 per cent. and operating on her for a large mass of fibroids, some of which were submucous, and which caused great anemia.

Dr. Charles M. Green of Boston recalled two cases in the practice of colleagues in which this preparation was made with the happiest results. The donor was prepared and ready at the time of the operation in these cases of low percentage of hemoglobin. Transfusion was done by the operator as soon as the tube was tied off, and the abdomen closed. The transfusion was immediate, and both patients recovered promptly.

Dr. T. J. Watkins of Chicago said the society was fortunate to have had these two excellent papers, and especially the very rich statistics of operations upon people with very low hemoglobin percentage. He had been rather surprised sometimes in blood findings as regards both hemoglobin and counts, and as yet blood examinations were deficient in that they only took into consideration the quality of the blood and not the quantity. The estimation of blood was something like the estimation of solids in the urine, taking the specific gravity without considering the amount of urine. One noticed this in preparing patients for operation. A patient might be improved very much by preparatory treatment, and yet the blood examinations were not correspondingly increased. This was also noticeable after operations, and he believed that it was a very safe statement to make that very often the blood increased more in volume than it did in quality up to a certain point. It seemed from his experience that the internist was more fearful of operations upon anemic patients than was the surgeon, and a limit of 40 to 50 per cent. hemoglobin seemed to be quite a safe risk. He had one case in which the hemoglobin percentage was between eighteen and twenty, yet a vaginal hysterectomy was done for a fibroid where the hemorrhage could not be stopped temporarily to improve the patient's condition with a good result.

Dr. E. C. Dudley of Chicago said he would like to emphasize a procedure that was useful and might not be new, and that was tightly plugging the uterine canal. In several cases, less than twelve perhaps, he had during two or three menstrual periods, or whenever the patient bled. tightly plugged the uterine canal, renewing the plug every day or so, so long as the hemorrhage continued, and by so doing, the hemoglobin percentage went up from 20 to 36 per cent., and then operation was undertaken with less risk.

Dr. R. R. Smith of Grand Rapids, Michigan, called attention to the use of nitrous oxide and oxygen in these cases of extreme anemia. He had been able to bring patients through with this method of anesthesia who would have been lost under ether or chloroform. Nitrous oxide was far less destructive to the red cells than ether, and especially chloroform. One little point to be observed in giving nitrous oxide and oxygen under these circumstances was that although patients took it well and easily and relaxation was good, they did not give the usual danger signs. They did not become cyanotic. Respiration was apt to become shallow, and one must be on guard in that way.

Dr. I. S. Stone of Washington, D. C., recalled acerta in case in which there was a great deal of bleeding, probably owing to changes in the arteries in the uterus. The condition of this woman was apparently favorable to operation except she was very anemic and had been for years. She had been unfortunately accustomed to taking morphine. She was operated on under the most favorable circumstances, which could be afforded her at the hospital. This was fifteen years ago. Vaginal hysterectomy was done and was easy, and yet that woman died without any known cause except that she had no resistance to the shock of the operation. She had a good result when she left the table, but gradually went on down. If that patient were here at the present time her case would be a suitable one for the transfusion of blood. He did not think he could recall any case of anemia from loss of blood during many years' experience where with proper treatment, whether it was the use of salt solution, rest in bed, etc., the anemic patient had not been brought up to a safe operative risk.

Dr. J. Clarence Webster of Chicago stated that he had always had very great fear of doing operative work where the hemoglobin was below 40 per cent. The statistics presented by Dr. Cullen were encouraging to him. At the same time, one should exercise the greatest precautions, particularly those brought out by Dr. Byford regarding preparatory care in the recurrent hemorrhage cases. He believed we ought to exercise special care in connection with the operation itself, and he desired to emphasize what Dr. Smith had said, that nitrous oxide and oxygen was of great value in these cases. This was a class of cases in which he had used novocain anesthesia and local infiltration anesthesia extensively.

Dr. Byford, in closing the discussion on his part, said he was rather surprised that no one except Dr. Watkins had called attention to anything about the blood, except the hemoglobin percentage. With regard to the amount of blood, it was in unison with an observation he had made, namely, that patients who were anemic stood operations well. It was a benefit to them because they had more blood. The more flesh they had, and the less sunken the eyes were, the better, and the circulation around the eyes would help somewhat, in that respect.

With regard to vaginal and abdominal operations, he had long ago come to the conclusion that he did not want to preform a vaginal major operation upon an anemic patient. He had had one or two surprises. The hemorrhage might not seem to be great, but these patients were under the anesthetic quite a while; there was oozing going on all the time, and when one had an anemic patient, it was enough to make a difference sometimes. Then the other extreme was noted, that is, a patient in undergoing an abdominal operation got along unusually well because the operation was rapid, and because the loss of blood could be better controlled, and in estimating whether one should perform a vaginal operation or not, it was well to pay attention to the blood count, to the number of red cells, and with the patient who had the larger number of red cells we could take more chances in doing a vaginal operation.

Dr. Cullen, in closing the discussion, said he was much interested in what Dr. Bovee had said in regard to operation in cases of low hemoglobin. His paper was written for the comfort of those who were forced to operate with a thoroughly low hemoglobin percentage. A number of cases that came in with a low hemoglobin percentage could be gradually built up until the hemoglobin was 40 to 50 per cent. In nearly all the cases mentioned the bleeding was so continuous or severe at the menstrual period, that it was impossible to build them up before operation is undertaken.

He was interested in what Dr. Dudley had to say with reference to packing the uterus. He thought a certain amount of chance was taken in packing the uterus. In a certain number of cases in routine examinations of specimens myoma was associated with pus or with pelvic adhesions, and if some of these cases were packed it would increase the tendency to infection.

He agreed thoroughly with Dr. Webster and Dr. Smith as to the use of nitrous oxide and oxygen in these cases and as to the value of it. He had for many years been using nitrous oxide in cases of low hemoglobin and in cases that were desperately ill, being afraid to use ether.

THROMBOSIS AND EMBOLISM FOLLOWING OPERATION AND CHILDBIRTH.

Dr. Benjamin R. Schenck of Detroit, Michigan, based this paper on a previous study of forty-eight cases supplemented by nine personal instances, four of which followed confinement and five followed operation.

Thrombosis of the pelvic veins was common and often unrecognized. It affected the veins of the legs, 381 times among 96,000 obstetrical cases collected from the literature, and 566 times after 49,161 operations giving percentages of 0.04 and 1.15 respectively. There were ninety-six instances after 3,204 myoma operations, or 3.0 per cent.

The etiology was difficult to prove. An analysis of many facts seemed to show that injury to the endothelial lining of the veins and slowing of the blood stream were important predisposing causes, but there must be some other factor and this Schenck believed to be the hemaglutins set free by hemolytic bacteria. His argument was as follows: thrombi were formed by the agglutination of platelets and red blood corpuscles. The most frequent cause of agglutination and hemolysis was the action of hemolytic bacteria. This action bore no relationship to the virulence as regards sepsis. Such bacteria might frequently be present without causing any of the ordinary symptoms of infection.

There were no reliable premonitory symptoms. Especial stress was laid upon the meaning of slight and severe pains in the chest during convalescence.

Prophylaxis began before, was kept in mind during and received particular attention after the operation. The author advocated systematic exercises while the patient was in bed.

Sixty-five per cent. of the affected patients never fully recovered. If complete restoration was to follow, it would come in the first year.

The status of the Trendelenburg operation for extraction of an embolus from the pulmonary artery was reviewed.

THE MANAGEMENT OF PUERPERAL THROMBOPHLEBITIS.

Dr. Palmer Findley of Omaha, Nebraska, reported ten cases, reviewed the literature on the subject, and then submitted the following propositions for consideration: 1. The Trendelenburg operation was surgically correct in theory, but as a practical proposition it was a questionable procedure. 2. The difficulties involved in the making of an accurate diagnosis before opening the abdomen were as yet insurmountable. Furthermore, it was not possible to judge with accuracy the extent of the infection within the veins or elsewhere after the abdomen was opened. We could not rely upon the sense of touch to locate with certainty the limits of a thrombus, nor could we judge with certainty the presence or absence of pus within the veins. Failure to find bacteria in the general circulation gave no absolute assurance of the localized character of the infection, nor could a physical examination of the lungs and other viscera exclude the possible presence of metastatic foci. 3. It was in direct violence to the rules of practice to traumatize tissues in the immediate neighborhood of a virulent infection. In reviewing the reports of cases he had been seriously impressed with the boldness with which some operators violated this time-honored principle of surgery. If the infected veins were not dissected out had we not locked the thief in the stable when we did no more than ligate above the zone of the infection and if we did dissect out the infected veins did we not incur serious hazards in the way of disseminating the infection? Furthermore, the risk of dislodging a thrombus in exploring the pelvic veins must be reckoned with. 4. It was a physical impossibility to ligate all the veins leading from the genita organs and unless all channels were blocked there could be no assurance of checkmating the infection. Among the ardent supporters of the operation were those who would ligate the lower end of the vena cava and both spermatic veins, claiming that the collateral circulation could be depended upon to reestablish the return circulation. Was this not an argument in favor of the contention that the venous channels leading from the infected uterus could not be wholly controlled by ligatures? 5. The physical resistance of all cases of puerperal infection was far below par, a fact which should make us cautious in adding further to their burdens. We might well rob them of the little resistance they possessed. 6. Little dependence could be placed upon serums and vaccines in these cases. 7. Whatever may be our views on the question of ligation of veins or upon the administration of serums and vaccines, we were all agreed that the body resistance must be supported by fresh air and nourishing food.

DISCUSSION.

Dr. C. Jeff Miller of New Orleans said he had been extremely interested in the subject of postoperative thrombophlebitis for the last year or so, and during the past winter he had occasion to study a great many cases and had changed his opinion somewhat as to certain phases in a paper which he presented over a year ago. First, as to the question of diagnosis. After he had one case with a favorable outcome, reviewed the treatment and authorities on the subject, he thought it would be an easy matter to make a diagnosis in these cases, but the work of this winter had changed his opinion regarding that point. In handling a large obstetrical service, he had had many cases that were infected. He had prepared to operate on four cases of septic thrombophlebitis, and blood cultures showed he was dealing with cases of septicemia or typical bacteriemia, and this discouraged him as to the selection of cases for operation. In this series he had one case of pneumococcic infection, with the usual prognosis given at the time. This patient recovered. In another case where he found streptococcus infection, the patient recovered, and it made him a little dubious about the effects of operation, and while he had not changed his opinion as to the theoretical feature of it, he believed we would have to get other means of diagnosis before we were able to select these cases.

He did not believe we ought to take the statistics of the cases to date and base any conclusions upon them, certainly not with a view to condemning operation, because he had occasion to go through the reports of 105 cases and he had found many of the operations were really postmortem affairs rather than true operative results.

Dr. T. J. Watkins of Chicago, stated that at the meeting held at Hot Springs, Virginia, he contended in the discussion that all evidence went to show that thrombophlebitis was the result of infection, and he was very glad that Dr. Schenck had brought out this point so clearly. Those who had contended against it being the result of infection advanced arguments with very little strength in them, and one argument was that patients got thrombophlebitis in clean cases. There was no one present who would say that the case was clean simply because the wound did not suppurate. We could get infections of considerable degree without reaching the point of suppuration. We very seldom operated without some contamination of the wound. It would be impossible to submit culture media to some of the influences to which wounds were subjected without getting contamination, and a wound that became contaminated very much was a culture medium.

Dr. Henry P. Newman of San Diego, California, thought some attention should be paid to the condition of the patient at the time of the operation. It was true, they were usually bad cases, and there was usually very marked lowered resistance, not infrequently requiring severe operative procedures, and a condition that would hardly be expected to resist bacterial invasion, which existed in probably every case that came before the practitioner for major intraabdominal operative work. The injury which was done to the tissues must be reckoned with as well as the lowered resistance of the patient subjected to this work. With the exception of one or two points, he desired to commend the interpretation and conclusions of Dr. Findley.

DR. JOSEPH TABER JOHNSON of Washington, D. C., stated that Dr. Schenck had referred to a paper which he (Dr. Johnson) had read before the society on a previous occasion, giving a description of nine cases, and in the discussion which followed a great deal of difficulty was found in describing the cases of thrombophlebitis, which occurred in the left leg in every instance reported except one. One patient who had had a thrombophlebitis of the leg had gotten nearly well, was feeling very happy, bidding her friends good-bye, and to make a long story short, she suddenly threw up her hands, gasped for breath a few times, and died. The cause of death was put down in the record as due to heart clot. The fact was that in all these cases there was not any evidence to lead one to think it could have arisen from infection because they were clean cases at the time of the operation, were getting perfectly well during their convalescence up to a certain point when the thrombosis occurred.

Dr. Findley, in closing the discussion, stated that he was sure that Dr. Watkins was right when he said that we could not limit the infection by ligating the veins above the infected thrombus. He wanted to remind Dr. Miller that in all of his ten cases the infection had spread through the veins.

THE CALCIUM CONTENT OF THE BLOOD DURING PREGNANCY, LABOR AND PUERPERIUM.

DR. W. H. MORLEY of Detroit, Michigan, quoted Blair Bell as saying that there were during the life of the individual three calcium periods in a physiological sense. First, the period of growth, when the young person or animal required all the calcium obtainable for the formation and growth of the bony skeleton. Second, the period of reproduction, when a calcium equilibrium as regards growth was reached and an excretion of the excess occurred. This was most obvious in the reproductive processes of women, when large quantities of calcium salts were first given up to the fetus and then for the formation of the milk during which the menstrual function was in abeyance. The third period was late in life, when no calcium salts were required for the building-up processes or for those of reproduction.

The determination of the amount of calcium in the blood in health and disease offered a probable explanation of many conditions whose etiology was still unknown. Ordinarily the amount of calcium in the blood was determined by volumetric or gravimetric methods. While either of these two methods was an accurate one under ordinary circumstances, their application in determing the amount of calcium in the blood required a large amount of blood in order to lessen the percentage of error.

A few years ago Mr. W. Blair Bell of the Royal Infirmary Liverpool, devised a simple yet accurate method for the determination of the calcium contents of the blood. The method required only a small amount of blood (viz., 100 cm.) and was as follows: an oxalic acid was first made up in the strength of 1 in 30 aqueous solution. In a small capsule or vial was put 250 centimeters of this oxalic solution (1:30). The finger of the patient was pricked and 100 centimeters of blood drawn up into a graduated pipette and immediately emptied into the capsule containing the oxalic acid solution. The stem of capsule was then sealed. The contents on shaking became uniformly chocolate-colored and the blood was laked. After ten minutes this mixture was ready for further dilution, but if necessary the final processes might be left over for some hours, although the sooner they were carried out, the better, for if left until the following day the heavy sediment of pigment might vitiate the result.

When the examination was to be continued the neck of the capsule was broken and 250 centimeters of the following solution added to the oxalic acid and the blood: acetic acid (1 per cent.) ninety-two parts, glycerine five parts. This was allowed to stand for about ten minutes, a rubber cap being placed over the neck of the capsule to prevent the evaporation. The capsule was then thoroughly shaken and 100 centimeters were withdrawn and immediately mixed in another capsule with 500 centimeters of distilled water, previously placed there. It was of this last mixture that the examination was made.

A drop was placed on a clean Thoma-Zeiss hemocytometer plate and the crystals of calcium oxalate were counted as one would count white or red blood cells and the number noted for each square, at least 250 squares, should be counted.

It had been found by Bell that a standard aqueous solution of 1 in 5,000 calcium chloride which was practically equivalent to a solution of 1 in 10,000 CaO, gave 0.59 crystals per square. Therefore an arbitrary standard had been determined that an average of one crystal per square was equivalent to a 1 in 6,000 solutions of CaO.

Bell had found in a large series of determination on ordinary individuals of middle life, that the normal, as estimated from this standard, varied from 1 to 4,000 to 1 to 5,000 of CaO in the blood.

In summing up his work Bell remarked, that he hoped to be able by further investigations to replace the normal calcium index at one.

The results of observations showed that there was a lessened amount of calcium in the blood of pregnant and puerperal women and of women in labor. The actual calcium index varied somewhat from 1.2 to 0.06 crystals per square. Assuming that the arbitrary standard of Blair Bell of 1.5 to 1.2 was the normal calcium index of ordinary individuals of middle life, the results tabulated showed that pregnancy, labor, and the puerperium caused a withdrawal of calcium from the mother's blood. Just what the destination of the calcium was, whether taken up by the fetus during pregnancy, by the uterus during labor, or by the breasts during lactation must be left for the later investigation. The object was simply to determine whether there was a lessening amount of calcium in the blood during pregnancy, labor and the puerperium. As this was simply a preliminary report, and as this work would be continued, no conclusions would be drawn at this time, but it might be interesting to state some of the possibilities that might result from a careful investigation of the calcium metabolism, not only in relation to some of the unsettled problems of obstetrics and gynecology, but of general medicine and surgery.

Drennan, in a series of articles a few years ago, discussed the phases of calcium metabolism, purely from a theroretical standpoint. The titles of her articles suggested the theories that she had, and a few will be quoted.

"The abstraction of calcium salts from the mother by the fetus, a cause of osteomalacia in the former." "The abstraction of calcium salts from the mother's blood by the fetus, a cause of large white kidney in the former." "The abstraction of calcium salts from the mother's blood by the fetus, the cause of puerperal eclampsia in the former."

This work covered a period of ten years and showed that calcium metabolism was considered, although no work was done on the determination of the calcium content of the blood until Bell devised his method in 1907.

Kastle, in a recent article, discussed the action of calcium salts and the onset of labor. In a still later paper he reported his results with calcium salts as an antiauxphylactic. He substantiated his theories by animal experimentation. Bell, besides devising a method for calcium determination in the blood, urine and feces, reported his work upon menstruation and its relation to calcium metabolism.

He further stated that calcium salts in the tissue played an important rôle in the physiology of the female generative organs.

From these considerations was it too much to hope or to prophesy some day the unsettled etiology of the toxemias of pregnancy might be explained by some disordered calcium economy on the part of the patient?

THE CONDUCT OF GYNECOLOGICAL OPERATIONS IN THE PRESENCE OF CHRONIC AFFECTIONS OF THE HEART.

Dr. Edward Reynolds of Boston, Massachusetts, stated that nothing was more striking in a discussion of cardiac cases with expert internists than the emphasis which they laid upon the statement that in the vast majority of all such cases the symptoms which the patient presented, and the degree of exertion which might be permitted to him, were far more dependent upon the state of the cardiac muscles and the degree of compensation, than upon the individual lesion which might be present.

Similarly the propriety of a surgical operation was to be decided by reference to the amount of symptomatology which the case presented under the ordinary exertions of daily life.

An operation done under the best conditions of modern surgery might be regarded as equivalent of a very moderate unusual exertion. The degree of that exertion varied to some extent with the severity and duration of the proposed operation, but under the conditions specified no ordinary operation should be regarded as involving more risk than that involved in a moderate extra muscular exertion. As the nearest feasible approach to a tangible standard, and with the understanding that he put it as no more than that, he would further define his position as a belief that a subject of valvular or other cardiac disease who was able to go up a flight of stairs at an ordinary walk without provoking more than slight breathlessness was fitted to endure an abdominal operation of average grade without suffering any grave increase of the ordinary risks, provided the other conditions to be spoken of were what they should be.

The prognosis in these cases depended upon the class of care taken of them, and that that care should include expert medical treatment both before and after operation; thoroughly expert anesthesia; and rapid, gentle operating.

Successful surgery was usually the result of thoroughly organized team work.

The surgeon should also depend upon the trained senses of the internist to tell him whether the case was at the given moment in the best condition to which he could be brought by medical care, and should decline to operate until that point had been reached. A time when there was the least shade of acute overstrain was the last time when any athletic exertion or operation, should be permitted.

From the standpoint of operative technic the surgeon who was to operate on a cardiac case should, in his opinion, select from among the several methods of operation that one of all those that would give satisfactory results, which he thought could be carried to a conclusion most rapidly and with the least violence. In cardiac cases rough, slow operating was especially dangerous.

After citing cases, the author concluded by saying that the risks were estimated by the symptomatology and if the surgeon was able and willing to give his patient all the advantages of modern treatment, it was surprising how seldom a chronic cardiac lesion would contraindicate a needed operation.

EXOPHTHALMIC GOITER AND PREGNANCY.

Dr. George Gellhorn of St. Louis, Missouri, contributed a paper on this subject, in which he drew the following tentative conclusions: 1. The complication of pregnancy and exophthalmic goiter, while comparatively slight in some cases, might constitute a grave danger to the life of the mother; 2. if the manifestations of Graves' disease were aggravated in spite of medicinal treatment, the interruption of pregnancy was indicated without delay; 3. the quickest, and therefore, best method of interruption was by means of vaginal Cesarean section; 4. spinal anesthesia was preferable to any other form of anesthesia in that it reduced the dangers from any operation on patients with exophthalmic goiter; 5. girls with well-developed hyperthyroidism should be advised against marrying; 6. if Graves' disease had appeared after marriage, conception should be prevented; 7. if vaginal Cesarean section be performed, tubal sterilization should be added.

DRUGS IN UTERINE INERTIA.

Dr. Hugo Ehrenfest of St. Louis, Missouri, stated that in view of the evident dependence of the strength of the uterine contractions on the general condition of parturient women, it could not be denied that certain general stimulants occasionally proved effective in primary inertia of the first stage, but especially in secondary inertia late in the second stage. Alcohol and strychnine were the two remedies most commonly employed in this manner. Strychnine in this respect probably had a peculiar value as a prophylactic when given systematically in the last few weeks of pregnancy to women who gave a history of a preceding tedious labor.

Morphine in secondary inertia often proved effective in overcoming the fatigue and exhaustion which caused inertia. Kehrer ascertained experimentally a direct local effect of morphine on the uterine muscle, stimulating in small and paralyzing in large doses. These experimental results would seem to harmonize with the clinical results usually observed.

There was one more important remedy belonging to this group, namely, sugar. In recent years in some large European maternities extensive and careful studies had been made of the possible importance of sugar as a general stimulant, especially in cases of secondary inertia. As to the practical value of sugar given to the exhausted woman in labor, there could not be any reasonable doubt. After doses of approximately 50 grams, about six square lumps dissolved in 500 c.c. of water, tea or milk, almost, as a rule, a marked effect on the labor pains became noticeable within the next half hour. Sugar should be used more extensively, particularly in secondary inertia of the second stage, because it was a remedy which was cheap, always available, not objectionable, never toxic, often effective and never harmful.

There were lastly to be considered three drugs which exerted a pronounced stimulating effect on the uterine muscle and often were employed in the treatment of uterine inertia. They were quinine, ergot and the extract made from the posterior infundibular lobe of the pituitary gland, briefly called "pituitary extract" without consideration of the different names of the various preparations on the market.

All those who used quinine would agree that it was unreliable in its effects, "whimsical and capricious," as it had been pronounced One never could tell before hand whether in a given stage it would act or not, but it seemed whenever it did work, it did all it was expected to do. Quinine strengthened the uterine contractions without interfering with their normal rhythm. Longer tetanic contractions were observed but rarely and never were of an alarming character. Recent reports of clinical observations made on large series of cases recorded success in from 50 to 75 per cent. of cases. Some of the apparent failures of quinine early in labor undoubtedly must be ascribed to the fact that slightly painful pregnancy contractions were mistaken for weak labor pains coming in long intervals.

The prevalent opinion concerning the value of ergot as an oxytocic was best expressed in the verdict rendered by Tyler Smith more than fifty years ago: ergot was a postpartum and never an antepartum drug. Most text-books on obstetrics denounced the use of ergot in labor, which to-day was given ony by ignorant midwives. In condemning ergot relentlessly in this manner one should, however, not forget that Herman in his book "Difficult Labor" published in 1910 described in detail the indications, when and how ergot should be given in the second stage of labor, or that Pruesmann in 1905 stated that ergot was used during the second stage of labor in the famous Olshausen Clinic in Berlin. It could not be denied that the indiscriminate use of any existing ergot preparations must be denounced as a dangerous practice, but there still remained well-founded hope that the ecbolic principle of ergot would be isolated and that it would be available as a specific oxytocic of standardized strength.

As to pituitary extract it was valueless for the purpose of starting labor. Its stimulating action was the more pronounced the longer labor had lasted, the further birth had progressed. Usually only the first contraction was stormy and tetanic in character, often lasting for several minutes. The duration of its effect varied greatly in different cases but on an average lasted about thirty minutes. Pituitary extract was a valuable adjuvant when labor had been started artificially by mechanical means.

A certain unreliability in the action of this drug undoubtedly was due to the fact that the preparations heretofore available simply represented an extract made of either 1/10 or 2/10 gram of infundibular lobe tissue, assuming that the posterior lobe always contained the same amount of active substances. Fuehner very recently had succeeded in isolating in the form of a crystallized substance the active principles which under the name of "hypophysin" now appeared on the market in the form of a 1 to 1,000 solution of standardized strength. If the problem of standardization actually had been solved pituitary extract undeniably represented the most valuable drug at present known for the treatment of uterine inertia.

OFFICERS.

The following officers were elected for the ensuing year, *President*, Dr. J. Whitridge Williams, Baltimore, Md., *Vice-Presidents*, Dr. T. J. Watkins, Chicago, Illinois, and Dr. Howard C. Taylor, New York City; *Secretary*, Dr. Leroy Broun, New York City, re-elected; *Treasurer*, Dr. J. Wesley Bovee, Washington, D. C.

Boston was selected as the place for holding the next annual meeting.

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF PHILADELPHIA.

Meeting of April 3, 1913.

The President, GEORGE M. BOYD, M. D., *in the Chair.*

DR. JOHN COOKE HIRST reported several

CASES OF HYDATID MOLE.

Hydatid mole, while a rare complication of pregnancy, is still sufficiently common to make its recognition and proper treatment a matter of importance. The case I wish to report all occurred in the period between June 1, 1912 and February 15, 1913.

CASE I, a primipara, aged twenty-three, supposed to be pregnant at term, had a uterus completely retroverted, and of a size just sufficient to fill the pelvis, and project about two finger breadths above the symphysis. She had had no periods for nine months, had had in the early months of pregnancy a marked pernicious vomiting and, while she had never felt fetal movements, believed herself to be within a few days of term. A diagnosis was made of probable hydatid mole, and the uterus was evacuated of about a quart of typical vesicular mole. There was no apparent involvement of the myometrium, bleeding was slight, and recovery uneventful. When seen on Feb. 10, 1913, this patient expressed herself as entirely well.

CASE II.—A primipara, aged twenty-seven, believed herself to be three months pregnant, and on account of some cramp-like pain and moderate bleeding, feared a miscarriage. She had had an unusual amount of vomiting, not sufficiently severe however to be classed as pernicious. The uterus was the size of a five months pregnancy, and there was no dilatation of the cervix. She was put to bed, given an opium suppository of 1 grain, and twelve hours later expelled spontaneously a large hydatid mole. In this case the true nature of the case had not been suspected, as there had been no discharge of vesicles.

CASE III.—This patient, a primipara, aged twenty-two, was admitted to the University Hospital, profoundly toxic, vomiting excessively, a history of three months pregnancy, an abdominal mass corresponding in size to a six months pregnancy, and behind it a sensitive, slightly movable mass. A diagnosis was made of ovarian cyst complicating pregnancy, with a possible hydatid mole, on opening the abdomen the large mass was found to be the uterus, instead of the cyst, and the smaller mass a double ovarian cyst. It was found impossible to put the uterus back in the abdomen, and on incising it, a large mole protruded. The uterus was then amputated, and the patient made an afebrile convalescence. While hysterectomy could hardly be advocated as a treatment for hydatid mole, this patient's condition when last seen (Mar. 1, 1913) is much the best of any patient in this series of cases.

Case IV.—A multipara, aged twenty-seven, seen July 23, 1912, had the typical history of four months pregnancy, uterus two fingers above umbilicus, pain, bleeding, a dilated cervix and no fetal parts palpable. A diagnosis of hydatid mole was made, and a large mole removed under ether anesthesia. Twenty-four hours after the operation the patient became comatose, deeply jaundiced, and died twenty-four hours later of acute hepatic degeneration. No autopsy was permitted.

Case V.—A primipara, aged thirty-two, supposed to be within a month of term, but with a uterus extending only one-half way to the umbilicus, a history of pernicious vomiting in the first three months of her pregnancy, and then an amelioration of the vomiting but not cessation. She had had no pain, no bleeding. There was no dilatation of the cervix. A diagnosis of a presumably dead ovum was made, and evacuation of the uterus advised. This was set for the next day (Aug. 10, 1912) but during the night the patient had two hours of severe pain, some bleeding and finally expelled spontaneously a quart of vesicles, and made an afebrile convalescence.

Case VI.—A multipara, aged twenty-nine, two previous children, was seen Sept. 2, 1912, with symptoms indicating an abortion at the third month. The uterus corresponded fairly closely to this in size, and no suspicion of the mole was formed at the time. The vagina was packed for twenty-four hours, and on removal of the packing, it was followed by about a pint of typical vesicles, the uterus was well contracted and obviously empty. The convalescence was uninterrupted.

Case VII.—This is one of the youngest patients on record. She was a primipara, married, aged fourteen years. The pregnancy was of three months duration, but the uterus reached four fingers above the umbilicus. There was profound toxemia, vomiting excessive, and she had had two severe hemorrhages, each followed by a discharge of gelatinous material. The diagnosis of hydatid mole was proven at the evacuation of the uterus, a very large mole, 2 quarts of vesicles at least, being removed with such severe hemorrhage, that complete evacuation was impossible, and the uterus was packed with gauze. Twenty-four hours later about a pint of vesicles was removed with placental forceps, and the uterus repacked. There seemed to be a good deal of invasion of the myometrium, and the uterine wall was exceedingly thin in many places. Except for a rather high fever, lasting five days, there was no further complication. This patient had been raped at the age of eight, and her present pregnancy was illegitimate at first, her marriage occurring two months later. This is not the youngest patient on record, there being one recorded at nine years of age, but the cases of fifteen or under are very few.

It is not my intention to delve into the literature of hydatid mole, this being a clinical report, but simply to emphasize the following points in the diagnosis and treatment.

1. In any pregnancy in which the size of the uterus does not correspond to the date that pregnancy is believed to have reached, especially if there is pain, bleeding and toxic vomiting, a hydatid mole should be suspected.

2. In my experience severe toxemia, with excessive or pernicious vomiting has been the rule.

3. The only certain sign of hydatid mole is the discharge of the vesicles.

4. Hemorrhage is a danger constantly to be feared.

5. As the uterine wall is often invaded by the growth, care must be used in evacuating the uterus, for fear of perforation.

6. A case delivered of a hydatid mole must be kept under observation at least three years, on account of the possibility of a chorion epithelioma.

DISCUSSION.

DR. BARTON COOKE HIRST.—It is interesting to hear a report of such an unusual number of hydatid moles. One thing that we ought to remember is the possibility of deportation of chorion to other parts of the body with development of symptoms in regions that have no connection with the pelvic organs but in which pathological conditions develop as a sequel of hydatid mole. I saw a case in private practice in which the woman went beyond term, and was supposed to have been pregnant for eleven or twelve months. The uterus though increasing normally in size for the first few months was ultimately the size of a six or seven months pregnancy. A large hydatid mole was removed and the woman made a good recovery. Some six months later, however, she died of a malignant tumor of the brain. She suddenly became comatose and never regained consciousness.

DR. JOHN A. MCGLINN.—I have had no experience with this condition. Several days ago I picked up an old book which was written by Meigs in 1848. He held that hydatid mole was not a degeneration of the chorion but that the bodies present were animals.

DR. BARTON COOKE HIRST.—Up to the nineteenth century these cysts were thought to be fecundated ovules and I need hardly remind the society that at one time each cyst was regarded as an embryo. The members no doubt recall the famous quotation from ambrose Paré about the Countess Mayuret of Flanders who gave birth to 365 children—182 males, 182 females, and odd one being a hermaphrodite.

As late as Pepys' time, he records in his diary that when in Ostend he made an excursion into the country to see the platters on which these children were presented to the Archbishop for baptism, the males as John the females as Elizabeth. The hermpahrodite seems to have been consigned to a nameless grave. He records the fact without intimating the least incredulity about it.

DR. J. O. ARNOLD reported a case of

ACUTE DILATATION OF THE HEART FOLLOWING LABOR.

The case is reported because of its possible interest in connection with the subject of sudden death following labor.

The patient, a woman thirty-eight years old, weighing close to 200 pounds, looked much older than her years. She had been married fourteen years before her first child was born, which event occurred three years ago.

She states that she always had good health prior to pregnancy, that she was not at all well while carrying the first child, but that the labor was comparatively short and easy, and that she was up and about in the usual time. She also states that she never fully regained her former good health and strength after the birth of the first child, that she was much more easily exhausted than formerly, and suffered more or less from shortness of breath upon even slight exertion. Still, she felt that there was nothing seriously wrong, and continued to do her household duties as usual until a few months ago when the burden of a second pregnancy began to tell on her general health, and to produce edema and varicosities of the lower extremities, which greatly restricted her activities. She was referred to me for attendance in confinement by her family doctor, in whose care she remained throughout pregnancy, consequently I did not see her before labor begun. I was not called until labor was nearly over, and having a long distance to go I found upon my arrival that the second stage of labor had terminated a half hour or more before I got there. In other words, the child was born in the absence of a doctor, at 2 A. M. on March 11, after a labor lasting about three hours, which the patient describes as not having been particularly severe, except in the last hour, when the pains were so rapid and so exhausting in their effects that she felt that she had no strength left when the child was born. I think it is of interest to note here also that she was not in bed at all during the labor, and that the baby was born with the mother in the squatting position at the bedside. Attendants had lifted the mother and babe into bed where I found both in apparently good condition. The child was relatively small. There had been no lacerations and no more than the normal bleeding, and when I had tied and cut the cord and removed the placenta, which came away very easily, the woman expressed herself as feeling fine, and there was certainly nothing in her appearance or general physical condition to suggest trouble. The pulse was good, the uterus contracted normally and the patient seemed rested and cheerful. The nurse tells me that her condition continued good throughout the day, so much so that the patient herself remarked as to how much better she felt than after the birth of the first child.

I visited her again on my regular rounds about 4 P. M., or fourteen hours after labor. This proved to be a most timely visit, for as I entered the house I met an excited messenger on the way to summon help. Hurrying to the bedside I found the woman in a half-sitting posture gasping for breath, deeply cyanotic and scarcely able to speak. This condition, I was told, had occurred suddenly upon the attempt of the mother to sit up in bed to nurse the baby, only two or three minutes before my arrival. It was evident at once that the woman was seriously ill—that some grave crisis had occurred, and that her condition was growing rapidly worse. She had no pain. A hasty examination of the chest revealed a very weak, diffuse, and intermittent heart sound. Undoubtedly the trouble was with the heart—most likely an acute dilatation. Acting on this assumption, I placed her flat in bed, on her right side and ordered a bag of very hot water to the precordium, while I prepared to administer hypodermics. Much to my discomfiture I found my hypodermic outfit was not ready for such an emergency and I was obliged to lose nearly ten minutes of valuable time, before I could give the first dose of stimulant. By this time the woman's condition looked well-nigh hopeless—she had developed an acute general edema of the lungs, was deeply cyanotic, unable to speak, pulseless at the wrists, generally relaxed and dripping with cold perspiration, and frothing large quantities of blood-stained serum from the mouth as she still struggled to breathe.

Starting with a tenth of strychnia and a fiftieth of atropine I gave (so the nurse says) seven hypodermic injections in the next half hour—two more of strychnia and atropine and four of brandy, which happened to be at hand, and the administration of which served to keep me doing something while waiting to see results from the stronger stimulants. By this time there were indications of a turn in the tide. The skin ceased to leak, the respirations appeared somewhat easier, and the radial pulse could again be felt, but it was fully an hour before I could see enough improvement to justify a hopeful prognosis. As the heart muscle began to regain its tone there could be heard a loud blowing mitral murmur, which gradually grew less evident from day to day as the patient improved, but which is still present, and is evidently an old lesion. The intermittent action of the heart also continued for about a week. There had been some edema of the legs before labor, but in the next two or three days the edema was not only enormously increased in the legs, but was pronounced throughout the whole body, and the secretion of urine was almost suppressed. She continued for several days to cough up great quantities of serosanguinous fluid, and to add to her sufferings, on about the fourth day she developed a pleurisy of the right side followed by effusion. When a specimen of urine could be obtained it was found to be loaded with albumin, and this albuminuria persisted although the output of urine had greatly increased and the edema largely subsided at the end of three weeks, at which time she was returned to the care of her family doctor. She was then (which was only a few days ago) able to sit out of bed some each day, was taking plenty of nourishment, had a fairly strong, regular heart action, and her blood pressure had come up to slightly above normal.

Dr. G. Morton Illman who was kind enough to see this patient for me some days after delivery, has verified the above statements and gives it as his opinion that the condition to which she had so suddenly succumbed was undoubtedly that of acute dilatation of the heart.

My own conclusions in the case are, that the woman had an old organic heart lesion for which, ordinarily, there was sufficient compensatory hypertrophy, but that she suffered throughout pregnancy with a more or less grave form of toxemia which seriously effected the cardiovascular system, and that the strain of labor so nearly completed the exhaustion of the poisoned heart muscle that the sudden effort to sit up in bed caused an acute dilatation of the heart, and came near to producing another case of so-called "sudden, unexplainable death following labor."

DR. EDWARD A. SCHUMANN.—I should like to ask Dr. Arnold how there was eliminated a diagnosis of pulmonary thrombus.

DR. COLLIN FOULKROD.—Some six years ago I had occasion to look up the literature on this subject and found that these cases were usually those of lowered blood pressure. With the lessened amount of blood in the circulation the patient suddenly sitting up in bed developed a clot either in the heart or pulmonary artery. It is interesting to know the conclusions of some men; it is reasoned that a preexisting bronchitis will cause irritation around the pulmonary arteries and predisposed to irritation inside the blood-vessel and cause clotting in the artery at the time of labor. In many of the cases reported the veins of the leg had shown some thrombi.

DR. ARNOLD, closing.—The question of diagnosis, of course, is the chief one to be raised in this case. The points on which I based my conclusions are: The fact that the condition came on earlier than embolism is apt to occur; that there was no pain or rapid running pulse as there usually is in thrombosis or embolism; that the signs of dilatation were evident at once—slow, weak, diffuse heart sounds, with a murmur that was apparently one of insufficiency. The fact also which was learned later, that she had had an old heart lesion, strengthened the conclusion that the condition was one of acute dilatation. Another point which I neglected to mention, is that in Dr. Illman's examination he discovered evidence of an old pulmonary lesion, presumably tubercular, which might account for the later developments in the lungs and pleura.

DR. STEPEN E. TRACY read a paper on

RENAL CALCULUS IN RELATION TO THE KIDNEY AND URETER.*

DISCUSSION.

DR. BARTON COOKE HIRST.—I have been much interested in the paper of Dr. Tracy which shows a familiarity with the subject which all men do not have. The work is along a line which has been in the hands of comparatively few. There are a great many cases with symptoms in the abdomen and pelvis which might readily belong to this type, and unless one takes the pains to go over them with some systematic patience, here and there a calculus will be overlooked. The *x*-ray is unsatisfactory in corpulent people who present these symptoms. I should like to ask Dr. Tracy whether he has seen the apparatus in which you get the sound of the catheter against the stone. The instrument struck me as being an ingenious thing and I purchased one for the University Hospital.

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*For original article see page 229.

A woman was brought into the Howard Hospital recently in whom the diagnosis of stone in the ureter was not difficult. Operation was recommended but as the patient was a working woman and could not take the time for operative treatment, she applied to a general physician. He told her that operation in these cases was not necessary and he gave her a diuretic. She afterward passed a stone which I had dislodged by the catheterization of her ureter. In that patient's mind the general physician who dislodged the stone from the ureter by one dose of Basham's mixture is a much better expert than I am.

Dr. Tracy, closing.—In regard to the bell catheter mentioned by Dr. Hirst, I will state that I examined this appliance carefully, about one and one-half years ago, and was rather skeptical of its value. Genitourinary men have since told me that they have not found it satisfactory.

I agree with Dr. Hirst, that ureter and kidney cases require an unlimited amount of time if they are to be properly and thoroughly investigated. Few patients appreciate the character of the work, or the amount of time consumed by such an examination, and are not willing to pay even a modest compensation for such service. I have had a number of cases of calculus in the ureter in which the calculus was passed after being dislodged by the catheter. Last spring, I removed a large calculus from a single functionating kidney and also a smaller calculus from the upper portion of the ureter, which caused anuria every time it rolled down into the ureter. The *x*-ray did not show these calculi. The patient was very fat and the operation was extremely difficult. As she had but one kidney, I made an incision through the organ only sufficiently large to insert a finger into the pelvis. A large stone, extending into the calices, was dislodged and removed. Realizing that this was not the cause of the anuria, I searched farther and removed a round stone from the upper portion of the ureter. No other calculus was discovered, but the exploration had not been as thorough as in the usual case, because it was not considered wise to disturb the single functionating kidney more than was absolutely necessary. The patient recovered from the operation and was discharged from the hospital in excellent condition. A short time afterward, she returned to the hospital suffering from anuria, which came on after an attack of severe pain in the left side. Cystoscopic examination showed that no urine was coming from the kidney. Catheterization of the ureter discovered an obstruction about midway between the kidney and the bladder. As it was not desirable to subject this patient to operation, it was decided to wait a few hours to give the stone a chance to pass. The ureter was injected with sterile oil, and the patient was allowed to have the pain, no morphine being given. After waiting eighteen hours it was decided that operation was imperative. Before anesthetizing the patient, it was decided to make a cystoscopic examination to ascertain the exact location of the stone at that time. Cystoscopic examination showed the stone to be located just within the left ureteral orifice. By careful manipulation, over a period of about one and one-half hours, the stone was gradually teased out of the ureter, which relieved the patient immediately, and there has been no further trouble.

Dr. B. F. Baer read a paper on

SOME POINTS OF TECHNIC.*

DISCUSSION.

Dr. E. E. Montgomery.—I well remember the beginning of Dr. Baer's work. I had the privilege of assisting him in some of his early operations. His description of the first patient recalls to me my first ovariotomy. It was done in the Philadelphia Hospital on the 17th of May, 1879. At that time I had the operative field subjected to the spray so thick that I could scarcely see my assistant on the opposite side of the table. This operation was done in the clinical amphitheater surrounded by pathological specimens in varying stages of decay, adjoining the room in which autopsies were made. I had this patient walk into the clinical amphitheater two weeks later, which I would not do now, to show the result of the operation. I attributed the success of the operation to the antiseptic precautions in spite of which I realize now she recovered. This operation which had been previously announced led to the attendance of a gentleman who afterward asked me to assist him in an ovariotomy. His patient had a large abdominal tumor weighing over 50 pounds. He came to the operation without any preparation for the ligation of the pedicle, bringing with him a clamp which was used extensively by a number of operators. When we came to remove the tumor we found that it had no pedicle. The only way we could apply the clamp would have been to apply it to the fundus of the uterus and bring this entirely out of the abdomen. He was at a loss to know how to proceed. He had no silk with him. I found that he had brought iron wire for closing the abdomen. I took some of this, secured the vessels and the tumor was removed. He troubled me for some five or six weeks subsequently as to what was to become of this iron wire left in the abdominal cavity. I tried to assure him it was another way to administer iron and that the patient would take care of it and recover.

It is very interesting indeed to hear men speak of their earlier experiences, the accidents and the methods employed to meet them during this period of pioneer work from which experience of ours the younger men have been able to profit. I know of no story which appealed to me more strongly than that I listened to by Alexander Dunlap who operated on a case of ovarian cyst in the woods of Ohio in the same year the Atlees did their first operation in Pennsylvania. He said he knew what belonged in the abdomen and he made up his mind that he was going to take out everything that didn't belong there, and this was the plan of procedure he adopted in doing his first ovariotomy.

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* For original article see page 222.

DR. BARTON COOKE HIRST.—I have nothing to say except that I have listened with great interest to Dr. Baer's paper. My work also began in those days when we used the spray. Dr. Goodell did his work in the hospital without any assistant except the resident physician. When he used the spray it was directed into my face, in consequence of which I used to go to bed until the next morning with carbolic acid poisoning. In those days I could not understand the mortality of the cases which came into the university. I felt that they had one chance out of four of going out in a box. I was serving also at that time in the surgical wards without any attempt at even ordinary cleanliness. We would then put our hands into the abdominal cavity with no other preparation than rinsing in a basin with carbolic acid solution. It was no wonder that the mortality was at that time anywhere from 25 to 75 per cent. It is a blessed relief to think that those days are gone forever.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OBSTETRICS AND GYNECOLOGY.

Meeting of March 27, 1913.

GEO. G. WARD, JR., M. D., *in the Chair.*

DR. HENRY DAWSON FURNISS reported several cases.

INTRALIGAMENTOUS FIBROID CAUSING PERIODIC RETENTION OF URINE.

The patient was a single woman, forty-seven years of age. Her menstrual history was negative. In August 1912, on rising one morning she found that she could not pass her urine. After several hours this inability passed away. She had no further trouble until September, 1912, when the same thing happened and this time catheterization was necessary. She had a similar attack in October, requiring catheterization. In January she had another attack which caused her to awake at 3 A. M., on account of the sense of bladder fullness and discomfort. She was catheterized at that time and since then the urine had been more or less cloudy.

After some questioning it was learned that she had had some frequency of urination since the spring of 1912. Since last fall she had been getting up two or three times during the night. The bladder irritability had decreased since taking salol in January. She had no hematuria and had passed no calculi.

The urine showed a few epithelial cells, no pus, no blood, no albumin and no sugar, but a few hyaline casts were present.

The usual bimanual examination was not made as the woman was unmarried. An attempt was made to pass the cystoscope but the instrument met with an obstruction and the beak had to be turned well to the left in order to make it enter the bladder. Only the left side of the bladder could be seen and it was found that the uterus was displaced to the left by a hard mass, more or less elliptical in shape, with the long axis running transversely. The mass was the size of two closed fists, placed side by side. On February 15, 1913, this growth was exposed through a median abdominal incision and was found to be a large intraligamentous myoma, springing from the left cornu of the uterus. This was approached through an incision over it, between the tube and the round ligament, and bluntly dissected out. The ureter was below and to the right of the mass and was not disturbed in the dissection. The large dead space was closed with a continuous suture of catgut, and the peritoneal edges were similarly brought together. The abdominal wound was closed in layers. For eight days the patient ran a temperature of 100° to 101° F. which was due to an exudate in the right broad ligament. This gave no further trouble and the patient left the hospital in two weeks.

LARGE BILATERAL RENAL CALCULI FORMING CASTS OF THE PELVIS. RADIOGRAPHS.

The patient was a nurse, thirty-seven years of age, who was seen for the first time on February 1. She had been in good health until the beginning of her present trouble which began about six years ago. At that time she was taken with severe pain in the left renal region and inability to void urine. She was ill for two weeks and a year later had a similar attack but this time the pain was in the right renal region. After this the attacks came on every six months, then every three months, and later every six weeks, alternating from one side to the other. During the attacks she had vomiting which seemed to relieve the pain. There was also dysuria but never supression as in the first attack. Three years ago she was taken ill, her symptoms consisting of pain, high temperature, and bloody and pussy urine. Since that time all the attacks had been on the right side. She began to lose weight three years ago, and for the past four or five months had been losing strength.

Physical examination showed a small, thin anemic woman. Catheterized bladder urine showed a large amount of pus and blood. Cystoscopy revealed a general catarrhal cystitis. Over the base of the bladder, in the bifurcation of the small blood-vessels, were seen small red slightly elevated spots; these were not tubercles. Dr. Furniss said he had seen these in only one other case and that was a case of renal calculi. Catheterization of the right ureter showed that there was no drainage from it, but a large amount of pus was seen coming down the ureter along side of it. Urine from the left side showed a moderate amount of pus and some red blood cells. An intravenous injection of 0.6 phenolsulphonephthalein did not appear in the bladder before the end of nineteen minutes.

Radiographs showed a shadow of a large branched calculus in each kidney and forming a cast of the pelvis.

On February 14, under gas-oxygen anesthesia, the right kidney was exposed through an oblique incision, brought into the wound, the pelvis exposed and the large calculus removed. The pelvis was almost a quarter of an inch in thickness. The fascia and muscles were closed with catgut and the skin with silk worm-gut. A cigarette drain was placed down to the pelvis. It was the author's intention to have this drain remain down for sixty hours, but in the dressing of the patient it was taken out. There was urinary drainage for seventy-two hours and then cessation. On the tenth day there was some escape of pus and a small amount of urine from the center of the wound. This persisted for two days and after that the wound was dry. The patient made a stormy convalescence; she had much nausea and vomiting for six days and extreme weakness. She was able to return home on the thirty-eighth day after the operation. The stone in the left kidney would be left until the patient had enough strength to warrant its removal.

Much damage to the kidney function had been done by the long presence of these calculi as was indicated by the marked delay in beginning elimination of phenolsulphonephthalein. Except for urgent indications it was not advisable to operate on cases showing such a slow elimination. Had he used ether or attempted to operate on both sides at once he felt sure that he would have lost his patient.

LEUKOPLAKIA UTERI, WITH CASE REPORT AND EXHIBITION OF THE SPECIMEN.*

Dr. Thompson T. Sweeney presented this communication.

DISCUSSION.

Dr. O. S. Hillman opened the discussion on Dr. Sweeney's report and said the specimen he presented gave one a very imperfect idea of the real condition at the time of removal because it was so shrunken. The question of leukoplakia was an old one and much treated of in the medical literature. To-day a great many cases of leukoplakia of the mouth and tongue were written about, as well as cases of leukoplakia of other parts of the body which were covered with similar epithelium. Some writers claimed that leukoplakia of the esophagus was caused by indulgences in alcohol, but this was only conjectural. Leukoplakia was also found in the bladder which was lined by stratiform and transitional epithelium. Cases of leukoplakia occurring on the penis had also been reported, and less frequently on the vulva, vagina and uterus. In the body of the uterus they met with the columnar type of epithelium and this explained why metaplasia occurred there. This condition of leukoplakia in the mucous membrane was identical with hyperkeratosis of the skin—simply a pathological process due to a thickening of the superficial or horny layer, the stratum corneum. Syphilis had been accused of being a cause of leukoplakia, but there was no definite proof of this. In leukoplakia buccalis syphilis might be present, but sometimes it was absent. However, in a certain percentage of the cases syphilis was found to be present. Dr. Hillman believed that if syphilis was present, it was merely a coincidence and not an etiological factor. It was remarkable that in these cases of leukoplakia, from a clinical as well as a pathological point of view, it was so extensive. In the case reported the whole surface was practically involved, extending even to the cuff of the vagina which was attached. The thickening of the horny or superficial layer was very marked and this gave rise to the typical clinical appearance when seen through the speculum. It was bluish or opaque and covered the surface like as if there was an hypertrophy of the superficial layer, the stratum corneum, of epithelium.

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* For original article see page 243.

There was one very important point to be considered, the predisposing liability to the development of malignant disease. In talking with a dermatologist who had seen a large number of these cases, he was informed that leukoplakia ended in cancer in from 1 to 2 per cent. of the cases and he thought that this was possible, judging from the pathology. There was a chronic irritation of the surface which continued over a long period of time; if the disease lasted long enough there certainly would result an irritation of the epithelium. This was one of the factors which was so important in the development of an atypical proliferation and developing carcinoma. Although these cases were comparatively few in number one must consider this point in the treatment of every case of leukoplakia.

Dr. Hillman called attention to another point in connection with these cases, the serosanguineous discharge; this was due to the marked vascularity and inflammatory reaction; the fibromuscular tissue was the site of inflammation, and was associated with a marked injection and congestion of the blood-vessels which always accompanied this serosanguineous discharge. Some dermatologists claimed that treatment was absolutely ineffectual in leukoplakia. Amputation of the cervix or even hysterectomy was justified in view of the possibility or probability of the development of malignant disease. He referred to a case of leukoplakia buccalis in which the whole mucous membrane of the mouth seemed to be made up of a mass of bluish membrane and on one side underneath the tongue a small fissure had developed with considerable induration around it which looked very suspicious of a beginning malignant disease. In such cases operation would be a very serious procedure.

One of the remarkable things to be considered in connection with leukoplakia was the rarity of it in connection with the genitalia. In view of the fact that leukoplakia was so common in the mucous membranes of the tongue, the penis, the bladder and other portions of the body it seemed to him rather remarkable that more cases were not reported and this suggested the possibility that many cases were overlooked, or mistaken for a chronic cervicitis for instance. As stated by Dr. Sweeney there were two forms of leukoplakia, the false and the true. The true form could hardly be mistaken being characterized by a marked thickening of the epithelial layer which made it opaque. They had taken three or four sections from the cervix in Dr. Sweeney's case and they illustrated from a pathological point of view the typical changes, the thickening of the superficial layer of cells and the production of these granules in the so-called stratum granulosum, giving an inflammatory reaction in the subepithelial tissues.

DR. ROBERT T. FRANK said that the case reported by Dr. Sweeney was an exceedingly rare one. Differences of opinion regarding the etiology were still entertained, but apparently any long-continued irritation, no matter from what source, must be held responsible. He differed with Dr. Sweeney in only one regard, that was as to the nature of the serosanguineous discharge, which should be interpreted as the causative irritant, not as a criterion of the severity of the disease, or as arising from the leukoplakia itself. The discharge was a residuum of the antecedent and partly healed gonorrhea, which could no longer be demonstrated even by bacteriological methods (spreads). He conceded that the syphilitic infection might be merely coincident.

Dr. Frank agreed that the proper treatment in this case was hysterectomy, but warned that the diagnosis of leukoplakia should be made with caution in women afflicted with complete prolapse, whose protruding cervix, exposed to irritation and desiccation, often showed a superficial epidermidization with hornification. From the microscopical examination of this specimen no doubt of its true leukoplakic nature could be entertained.

DR. THOMPSON T. SWEENEY closed the discussion by referring to the prognosis in these cases of leukoplakia and recalled a case which involved the tongue. This case was carefully watched for weeks and a spot was noted on the epiglottis. This was removed and examined and was found to be an epithelioma. Smoking was often given as a causative factor, but it was not in this case.

In the eight cases of leukoplakia of the cervix that had been reported, in none was there any metritis. There was a serosanguineous discharge from the cervical canal. This was the second case he had seen, the other being diagnosed clinically.

THE CLINICAL SIGNIFICANCE OF THE URINE IN PREGNANCY.*

DR. HAROLD C. BAILEY read this paper.

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*For original article see page 263.

DISCUSSION.

Dr. Frederic E. Sondern expressed his pleasure at being present and hearing the paper just read. Moderation of extreme views concerning the significance of one or other change in the urine in cases of toxemia of pregnancy is desirable, and accepting any particular change as a positive indication of the presence or absence of a dangerous condition should be opposed. Most clinicians and laboratory workers, who are in touch with the clinical aspect of toxemia of pregnancy, have always preached this caution in the past, and in consequence met with the bitter opposition of the enthusiast who would tie us to a narrow dictum that certain grades of faulty metabolism were positive indications for the emptying of the uterus. The animal economy does not functionate normally or abnormally according to strict rules, and what applies to one person does not necessarily hold with another. Dr. Sondern thought that, while it is desirable to interpret the significance of faulty metabolism in toxemia of pregnancy with caution, on the other hand the information obtained from the urine is of distinct value and should not be disregarded. The nitrogen partition is undoubtedly an index to the protein metabolism and serves a valuable purpose in estimating the functional ability of the liver. He still believes that intestinal auto-intoxication shown by faulty sulphate partition and frequently by excessive excretion of indican as well as faulty protein metabolism manifested clinically as so-called lithemia are predisposing factors in the toxemia of pregnancy. He also believes that cases of eclampsia must be divided into two groups. The one due to toxemia of pregnancy nad the other to an acute exacerbation of a chronic parenchymatous or interstitial nephritis. Eclampsia due to toxemia is more frequent, the warning signs are of much shorter duration and the postmortem findings are characteristic. Eclampsia or more properly uremia due to an acute exacerbation of a chronic nephritis is not so frequent, warning signs in the urine are evident long before onset of the acute symptoms, and the postmortem findings are also characteristic. For this reason alone a careful routine examination of the urine is necessary in pregnancy, and by this means the two types of eclampsia can usually be differentiated.

The laboratory procedure he advises in following up the urine in pregnancy is as follows: Look for evidences of intestinal auto-intoxication and faulty purin excretion and remedy as far as possible as a prophylactic measure. Always examine for evidences of an acidosis and when these are found determine as far as possible to what extent they are due to starvation. If clinical symptoms of toxemia exist with acidosis, nitrogen partition of the urine is desirable. For this purpose determination of total nitrogen, urea nitrogen and ammonia nitrogen is enough, but the examinations must be repeated. If increasing fault is found with increasing acidosis, excess of urobilin and possibly the presence of bile pigment this information is of distinct value to the clinician and should not be underestimated.

Evidences of nephritis, the presence of albumin and casts should of course be searched for at regular intervals. While faint traces of albumin occur in half the cases of pregnancy and should not condemn a patient to bread and milk in bed, on the other hand evidences in the urine of more than a stasis in the kidney from pressure on vessels should have closest attention, particularly if an increase in blood pressure exists. The boast of the obstetrician that he can successfully carry a patient with chronic nephritis through a pregnancy may be well justified but this practice is not without grave danger in many cases.

There is decided value in blood-pressure determinations made as a routine matter during pregnancy. Increasing blood pressure is a grave sign despite the clinical condition and the laboratory urine reports.

Dr. J. R. Murlin said he would consider the topic under discussion from a physiological standpoint. Dr. Bailey and he had worked together; they made studies on pregnant dogs, the work being done at the New York University and Bellevue Hospital Medical College and later at Cornell Medical College. They found quite a difference in the changes occurring in the pregnant animals. First of all were the quantitative and not the qualitative changes. Naturally they expected certain changes in the pregnant animals, evidences of building up a new organism inside itself; immediately after conception it was expected the animal would begin to build up certain materials, to synthesize certain things. Four weeks following conception in the dog (corresponding to the third or fourth months in the human being) they found there was a minus-nitrogen balance; the animal through the feces and kidneys gave off more nitrogen than was taken in the food. He found that others had discovered the same thing. One called attention to the fact that this corresponded to the period of morning sickness in the women, and suggested that the two processes were related.

Another believed that this was accompanied by certain symptoms, especially a disinclination to eat; during this period they were less inclined to eat than later on. He suggested a causative relation between the nitrogen balance and the period of morning sickness.

Following this, Dr. Murlin made a further suggestion. The placenta was not fully formed until about just the time of high nitrogen balance, the period of plus-balance, and his suggestion was this: that until the placenta was fully formed enzymes might escape in the maternal circulation and cause trouble. Animals could be in constant supply of nitrogen and the nitrogen balance sustained throughout the period of gestation.

With regard to the qualitative changes in the urine, when the animal began to retain large quantities of the nitrogen taken in as food for the growth of the products of conception, the nitrogen was retained just for that purpose and this was only told by the nitrogen partition throughout the period of gestation. It was the urea nitrogen that was held back for the growth of the fetus; therefore, one would expect to find a low urea output.

In the human being this did not occur as in the dog. There was one-fifth the maternal body weight turned over to the fetal products by delivery. Greater changes were noted in the urine of the dog than in the urine of the human being, facts that had been borne out by other experimenters. The low urea output was purely a physiological one and was exactly what did and should occur. Figures had recently been published which bore out this observation.

There was another change which was physiological. In late pregnancy the amount of creatinin was less per kilogram of body weight than in a nonpregnant person; creatinin was a substance that was found in muscle. In a normal healthy individual the amount of creatinin was an index of muscular efficiency. What could be expected in a pregnant woman? There was an increase in weight due to material not metabolized at all and due to an increase in the nonstriated muscle of the uterus. Also the growth of the fetus itself was poor in creatinin which was a maternal substance. So all this increase in weight was due to several causes and was accomplished by the smaller output of creatinin per kilogram of body weight. In the urine of the pregnant woman was found creatinin. This appeared when there was undernutrition, such as a muscular dystrophy. Also it appeared in the urine during the puerperium and as the result of autolysis in the uterus. Why did creatinin appear during the later weeks of pregnancy? Two suggestions were offered. The fetus produced creatinin; possibly it passed through the placenta and was excreted by the mother's kidneys; also in the mother's own body creatinin was] formed and excreted. There was a distinct relationship between the carbohydrates contained in the food and creatinine. Creatinin appeared in the urine of children, and it was believed that when children took large quantities of carbohydrates, creatinin did not appear in the urine. But ordinarily children did not get enough carbohydrates to prevent this excretion of creatinin. In a normal person purin nitrogen was found to be higher in a pregnant woman than in a nonpregnant person. Purin nitrogen was the result of the disintegration of nitrogen protein (nitro-protein). Why should purin bodies taken together appear in the urine of a pregnant woman and not in one who was not pregnant? Dr. Murlin believed it was because of the higher nucleometabolism in the fetus. They knew in their studies of the urine, in infants, the output of urine acid was higher in proportion to the weight than was found in the urine of adults. Uric acid infarcts were due to an excessive excretion of uric acid in postnatal life. That was the natural explanation for the larger output of purin bodies in the urine of pregnant women, and this was perfectly physiological. Therefore, when they found such changes in the urine of pregnant women no alarm should be felt.

The determination of the amino-nitrogen was not an easy matter and until one or two years ago they had no way of determining it. Amino-acid might come from the products of digestion in the alimentary canal. It might have some pathological source.

If there was a leaking back from the circulation of the mother, a certain portion of it was lost.

With regard to the changes in the amount of ammonia, the fact that lactic acid was produced in or during convulsions would be to infer that lactic acid might be the cause of the increase of from 15 to 30 per cent. of the ammonia in the urine. They found only 80 mgs. of ammonia. He suggested that acidosis should be ruled out entirely, for most of the eclampsias started for days before any urinary analyses were made. Again cathartics always resulted in sweeping out the intestine, lowering the absorption from the intestinal canal, and the ordinary amount of ammonia in the urine then appeared to be high. In one case in which there was a violent catharsis the percentage of ammonia was increased from 7 to 17 per cent. This increase was no doubt due to the catharsis.

Dr. Robert T. Frank said that the cause of eclampsia was the subject of many theories and nearly everything that had been advanced had been explained away, all but what had reference to the fetus and the placenta. What interested him the most was that the more physiological work done, the more direct application of clinical facts were presented. Certainly when they took into consideration that nephritis and autolysis and similar conditions had been advanced as the starting-point of eclampsia, work of this sort was very valuable. Certain criteria, however, did not hold good at all. He thought one might as well accuse the brain as a cause of eclampsia as the kidney or the liver. The cause was to be found in something in the placenta or in the fetus. One could not accuse the intestines.

They had been speculating and theorizing a great deal regarding the cause of eclampsia; one person had stated that it was serological. If Folin's methods would stand the test, then they had advanced a step farther and this had reference to a possible leakage in the placenta of ferments, amino-acids, etc. Dr. Frank said he had attempted to determine the ferment content of the placenta and he found no difference between the ferment in an active and a passive placenta. The suggestion he had to make, if Folin's method held good and could be trusted, was that it meant immediately a certain plan for bringing about certain results, that in a large animal he saw no reason for not using this afferent blood and using the placenta for efferent blood. This might be the starting-point for advanced work on the fetal metabolism and its effect upon the mother.

Dr. William S. Stone thought that it was agreed that all was not known on this subject. The type of cases described was well known and the kind that made a great impression upon the people. A woman without any premonitory signs, at least signs that were not considered of importance, suddenly would have a severe headache, sometimes a general edema with the urine boiling solid, with somewhat severe convulsions; labor would be induced, the child delivered and the woman would get well. These cases would get well even if one did not induce labor prematurely. They were of a definite type and different from the other cases which they had been talking about. He did not think, and he believed that Williams and others who taught obstetrics would agree with him, that they should try to make such application of urinary findings as 50 per cent. ammonia in the urine; one would soon find that it was a wrong thing to do and one should not hold up as an index for the induction of labor the appearance of this amount of ammonia in the urine.

With regard to what was said about starvation, some patients were far from being starved and he recalled some actually eating two pieces of mince pie before their convulsions. The question of starvation, however, did come into consideration. But the real thing was this: He had learned that there was a considerable metabolism in a woman before pregnancy. Many women who were pregnant were constipated although the bowel movements were perfectly normal otherwise. The urinary findings would often help one in solving the problem and, in his own experience, Dr. Stone found that there was a large amount of urine passed during the later months of pregnancy with a very low specific gravity and with a low urea output. He also knew that indican sometimes gave them signs of intestinal disturbances which did not cause symptoms but which had something to do with the symptoms. He also knew that the presence of albumin was significant, more significant if casts were present as well. All these things were known fifteen or twenty years ago. Almost from the very beginning of these eclampsias they knew they were dealing with something entirely different in many cases from simply cases of chronic Bright's disease; they were not cases of chronic Bright's disease and this was known twenty-five or thirty years ago.

In regard to the nitrogen partition, Dr. Stone did not think it was at all practical because it took too long; the patients got well or died before they could arrive at anything at all satisfactory from the nitrogen partition. Disturbances of the nitrogen partition did not appear to have much significance. In many cases it was in the hands of men who did not know how to interpret the nitrogen at all. Nevertheless it was the metabolism which was faulty and much could be gained by clinical observation.

TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

Meeting of January 10, 1913.

DR. DONNALLY *in the Chair.*

DR. MILLER presented a specimen of GALLSTONES with the case report.

DR. WHITE called attention to the ingenious T-shaped rubber drainage tube for the common duct. He said also that he had found the transduodenal method of approach to the common duct practically impossible on the cadaver without the stone in the duct as a guide.

DR. STONE said that his experience had been more frequent with common duct stones higher in the duct which could be cut down on above the duodenum. He had done one case of transduodenal approach to the common duct which had been unsatisfactory. The effect of the operation on the mucosa could not be determined. For drainage he sutured a rubber tube to the site of incision into the duct but did not put the tube into the duct. He asked whether the duct had been dilated above the stone.

DR. MILLER thought that drainage into the duct would save some of the adhesions. The common duct had been dilated above the stone and he had used for drainage a female rubber catheter size 30 French.

DR. WILLSON presented the history of a case of

CESAREAN SECTION FOR THREATENED ECLAMPSIA AND DEATH OF THE CHILD FOLLOWING CIRCUMCISION.

R. W., iii-para, about thirty years of age, referred by Dr. S. S. Adams. In her first pregnancy the patient had an attack of eclampsia at term and was delivered of a dead child by a difficult high forceps operation.

The second pregnancy and labor were uneventful, and the patient gave birth naturally to a girl baby, who was seven years of age at the time of the next pregnancy.

The patient was seen early in the third pregnancy. She was quite corpulent, complained a great deal of pain in the lower abdomen and there was considerable tenderness. This condition gradually improved. The pelvic measurements were normal. The urine was examined at frequent intervals and at no time contained albumin or casts. Confinement was estimated for the middle of December, 1911.

A specimen of urine examined on the afternoon of December 10 contained a marked trace of albumin and the patient was requested to save a twenty-four-hour specimen of urine. Early on the morning of the 11th, however, I was notified that labor had begun.

The course of labor during the day was thoroughly unsatisfactory. The pains were sharp and most annoying to the patient, but occurred at irregular intervals, and cervical dilatation was slow. The child lay in L. O. A. The patient was highly nervous and stood the long delay badly. About 4 o'clock in the afternoon it was thought advisable to gain some rest by the use of morphine, and 1/2 grain was given hypodermatically and repeated at 8 o'clock. The pains were not stopped, however. At this latter hour the conditions were as follows: The cervix was nearing complete dilatation, the membranes were unruptured, the child's head was freely movable above the pelvic brim. The patient's actions were sufficiently peculiar to attract general attention. She complained of seeing flashes of light before the eyes, but objected to being questioned and often refused to answer. The blood pressure was 145 mm. Hg. Practically no urine had been passed during the day.

At this time Dr. Adams saw the case with me and it was agreed that delivery was indicated and that the patient had better be moved to a hospital, as the evidence all pointed to an impending eclampsia. The patient was accordingly taken to the Georgetown University Hospital, prepared for delivery and anesthetized. As it was thought that a Cesarean section might be necessary, Dr. Vaughan saw the patient and kindly consented to assist at the operation if it were decided on.

The membranes were ruptured and a large quantity of liquor amnii, stained with meconium, escaped. The head was freely movable above the brim, but could be fixed in it by pressure from above; it was large and apparently well ossified but no reason was seen why it should not pass through the pelvis. The axis traction forceps were applied, and a few tentative tractions made, but the application was not satisfactory and the instrument was removed to permit further examination. At this time a loop of cord could be palpated along side the head, and it was discovered that the fetal pulse was about 60 a minute. The most commonly accepted procedure under all the circumstances would probably have been podalic version and immediate extraction. The escape of meconium and the slow fetal pulse showed that the child was already in a state of asphyxia, and taking into consideration the large and well-ossified head its chances of surviving even a very slight delay in the extraction of the after-coming head, were thought to be very slight. It was therefore decided to deliver by abdominal Cesarean section in order to make sure of a living child. The operation was done immediately, iodine being used to disinfect the abdominal wall, and the uterus being incised after delivery from the abdomen. The placenta was directly under the incision. The mother suffered considerably from meteorism the first few days, but made an uneventful recovery, the incision healing by first intention.

The child was a male, weighing some few ounces over 9 pounds. It was in a state of livid asphyxia when delivered, but respiration promptly established itself most satisfactorily. At the suggestion of Dr. Adams, the Resident circumcised the baby by clipping of the end of the prepuce, trimming back the mucous membrane to just in front of the corona glandis, and uniting the skin edge to it by three or four interrupted sutures. This was done about midnight of Monday Dec. 11.

The baby progressed very satisfactorily in every way and there seemed to be nothing abnormal about the wound or the prepuce. There was more jaundice than is usually seen, but in every other way the child seemed normal and began to gain in weight. On the night of Sunday the 17th, however, the nurse found a considerable amount of blood on the diaper and found that the bleeding was from the foreskin. The Resident was unable to stop the bleeding by hot applications or pressure and took a few fine catgut stitches which controlled it. The next morning the bleeding began again. I found the skin and mucous membrane united and entirely healed from the frenum around to the right for about two-third the circumference of the penis. The bleeding was coming from the remaining third. I removed the stitches and on exposure to the air the bleeding ceased. A slight oozing persisted until that evening, when the bleeding became quite active. Twenty cubic centimeters of sterile horse serum was then injected subcutaneously in the back. The bleeding had checked somewhat before the administration of the serum, and there was nothing but a slight oozing until the next afternoon, when it broke out afresh. At this time the actual cautery and Monsel's solution were tried, but without success. I then attempted to clamp together the edges of the skin and mucous membrane for the one-third of their circumference from which the bleeding came. This was successful temporarily, but as soon as the skin became rubbed a little by the hematol, it began to bleed, and during the night the oozing continued steadily. The baby was steadily and rapidly losing weight and looked greatly emaciated. A slight ecchymotic spot developed in the lobe of the ear, from which blood was removed for examination, but there was none found at the middle puncture in the back, and no blood was lost except from the prepuce. On the next morning, Wednesday the 20th, Dr. Vaughan saw the baby and reapplied the clamp. Forty cubic centimeters of sterile horse serum was administered hypodermatically and rapidly absorbed. During the morning the baby kicked off the clamp, which resulted in an immediate hemorrhage of such size that the little patient appeared to be practically exsanguinated. Following this Dr. Vaughan made an attempt to transfuse from the radial artery of the father, but the femoral vein was so small and so empty, that the mechanical difficulties proved unsurmountable. The baby died about 5 P. M.

The features of particular interest in this case, to me, are

1. From an obstetric point of view, the question, in selected cases, of the advisability of delivery by Cesarean section with the idea of saving the life of the child, when more commonly employed methods of delivery seem to jeopardize it too greatly.

2. From a pediatric point of view, the question of what was the nature of the condition producing the child's death? Hemorrhagic disease of the new-born, or hemophilia. I believe it to have been the latter.

DISCUSSION.

Dr. Moran described the case as one of advanced obstetrics and considered the section indicated by the prolapsed cord, the poor pulse, the previous difficult labors. The operation was justified in the weight of the child and the symptoms of threatened eclampsia. The condition in the child seemed to be one of hemophilia. The fact that there had been no bleeding from the ear puncture would not militate against the diagnosis of hemophilia.

Dr. Corley asked if the jaundice had been present before the circumcision.

Dr. Abbe said that the Cesarean section was amply justified but the circumcision seemed a bit premature. While in a certain number of cases in infants circumcision was expedient and in cases liable to neglect was most desirable he had never seen a case in which circumscision was absolutely necessary. He had always found retraction of the foreskin possible, if not completely at one sitting, certainly after two or three partial retractions and with no instruments other than the fingers of the operator. In this case the circumcision had been done by Dr. Willson following advice, at a time prior to that common to the development of icterus neonatorum and was a strong argument to postpone circumcision if it is to be done at all until the day set by the Hebrew custom for its performance. The presence of the jaundice obviated the necessity of calling in hemophilia to explain the persistent bleeding.

Dr. Corley believed circumcision indicated in many cases and indicated by the pearls of smegma commonly found behind the adherent foreskin.

Dr. Stone asked for an explanation of the difference between the jaundice of the new-born and that of adults.

Dr. Prentiss said that the condition of local hemophilia had been described and cited one case of persistent hemorrhage from the tonsils that lasted several days after a tonsilectomy and was finally controlled only by suture of the two pillars of the fauces. The same patient later had not had excessive bleeding from an operation for inguinal glands.

Dr. White presented the essay of the evening on

OVARIAN TERATOMATA.*

DISCUSSION.

Dr. LeConte said that the trouble in the pathologist's classification of ovarian teratomata came from the lack of the case history, the diagnosis being made solely on the section of the specimen. He cited a case of dermoid with a twisted pedicle and another case of adherent

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* For original article, see page 236.

Dr. LeConte asked for suggestions as to the etiology of these dermoids.

Dr. Lawson said that histologically these teratomata represented imperfectly developed individuals inside of another individual. In the embryo the head was the dominant feature so that in a teratoma it would not be surprising to find hair and teeth. The origin from polar bodies that were limited in number was not as probable as from germ cells that had gone on developing by parthenogenesis. The most common site of teratoma was in the ovary or testicle.

Dr. Willson called attention to the improbability of the teratomata coming from the polar bodies since they did not exist in the interior of the blastoderm. The possibility but improbability of the origin from early blastodermic cells that had gone astray was noted. The origin that seemed to him most probable was the parthenogenesis of ovarian cells stimulated by pregnancy or some internal secretion. The prevalence of parthenogenesis in lower animals he illustrated in the bees, among which the queen if prevented from mating herself, laid eggs giving birth to male bees; and again the queen bee isolated from other males of the same species but mated with males of a different species, laid eggs that hatched hybrid females and neutres but males of the same species as the queen. So that parthenogenesis was accepted as the method of reproduction of the male bees. Dr. Willson also spoke of the occurrence of teratomata most frequently in the sexual glands and next most often in the parotid gland which seemed to be associated with the ovary and testicle.

Dr. Abbe called attention to a paper read some two years ago by Dr. Fremont Smith on mumps as an acute general affection most commonly effecting the salivary glands, frequently effecting the pancreas, testicles and ovaries and at times many of the other organs of the body. He asked whether the frequency of teratoma occurring in the parotid gland might not be thought proportionately greater than it really was because the patotid was easily examined while tumors of a similar size in some other organs for example the pancreas would probably escape detection.

Dr. White in closing suggested that the operators finding dermoids send them to the pathologists for examination with a history of the case.

REVIEWS.

COMMERCIALIZED PROSTITUTION IN NEW YORK CITY. By GEORGE J. KNEELAND. With a supplementary chapter by KATHERINE BEMENT DAVIS, Superintendent of the New York State Reformatory for Women. Introduction by JOHN D. ROCKEFELLER, JR., Chairman of the Bureau of Social Hygiene. New York: The Century Co., 1913.

This book contains several chapters of considerable interest to medical men on account of the close relationship which exists between prostitution and the propagation of venereal diseases. The organization which has studied this subject is to be complimented on the care and thoroughness with which it has tabulated and published the results of this work. Remedies for improving the situation are suggested but recommendations are quite generally omitted. One is appalled in reading the book of the extremely commercial and selfish character which dominates the situation, and it must be a source of regret to the medical profession that any of its members should have allied themselves with such establishments in the manner described. It would appear to be a simple enough matter to overcome this deplorable situation.

The book is well worth careful attention by the profession as well as the thinking portion of the lay public.

HYGIENE AND SANITATION. A Text-book for Nurses. By GEORGE M. PRICE, M. D., Director Joint Board of Sanitary Control New York State Factory Commission, pages 236. Lea & Febiger, Philadelphia and New York, 1913. $1.50 net.

In the expansion of the functions of the trained nurse her duties are no longer limited to the care of the sick, but she has become a priestess of prophylaxis in social, municipal, and public health work. In these activities a fundamental knowledge of the principles of hygiene is necessary for intelligent work. This book gives broadly a knowledge of hygiene in its various branches. Rules for the care of the sick have been omitted as these are taught to the nurses in their regular training.

GYNECOLOGICAL OPERATIONS, including Nonoperative Treatment and Minor Gynecology. By HENRY HARTMANN, Professor of the Faculty of Medicine, Paris; Surgeon to the Laennec Hospital, Paris. Authorized Translation under the author's supervision by DOUGLAS W. SIBBALD, M. B., Ch. B., Edin., Formerly Physician to the British Hospital, Levallois-Perret, Paris. Large octavo of 535 pages, with 422 illustrations, some in colors, Philadelphia: P. Blakiston's Son & Company, 1913. Price $7.00.

This work has proved a great success in France because of its eminently practical and careful exploitation of a field heretofore imperfectly dealt with in that country. It gives a very complete exposition of the various methods of treatment employed in gynecology. It is well illustrated. The translation is particularly happily accomplished. Technically it is a fine specimen of book making. The text is divided into five parts. Part 1 discusses means of diagnosis and treatment, including the physical examination, minor gynecology, and physical agents used in gynecology. Part 2 discusses the technic of operations on the vulva, vagina, uterus and adnexa. Part 3 describes operations done by the abdominal route. Part 4 gives the therapeutic indications in diseases of the genital system of women, and Part 5 operations on the urinary apparatus.

It is a work that can be read with both pleasure and profit by any one interested in the various problems of gynecology.

APPENDICITIS. Its History, Anatomy, Clinical Etiology, Pathology, Symptomatology, Diagnosis, Prognosis, Treatment, Technic of Operation, Complications, and Sequels. By JOHN B. DEAVER, M. D., Sc. D., LL. D., Professor of the Practice of Surgery, University of Pennsylvania; Surgeon-in-Chief to the German Hospital; Visiting Surgeon to the Hospital of the University of Pennsylvania, Philadelphia. Fourth edition, pages 378. Fourteen illustrations. Philadelphia: P. Blakiston's Son & Company, 1913. $4.00 net.

The fourth edition of this popular book bears evidence of careful and quite extensive revision. This is shown particularly in the chapters on the treatment of peritonitis in general and of appendicular peritonitis, which have been broadly revised. Considerable has been added to emphasize the importance of chronic appendicitis. The place and meaning of the leukocyte count and the differential formula, Lane's bands, Jackson's membrane and the mobile cecum, are all discussed. There is little change in the chapters on pathology save in the discussion of carcinoma of the appendix.

A TEXT-BOOK OF MIDWIFERY. For Students and Practitioners. By R. W. JOHNSTONE, M. A., M. D., F. R. C. S., M. R. C. P. E., Assistant to the Professor of Midwifery and to the Lecturer on Gynecology at the University of Edinburgh; Extern Assistant Physician, Royal Maternity Hospital; Obstetric Physician, New Town Dispensary; University Clinical Tutor in Gynecology, Royal Infirmary; Gynecologist Livingston Dispensary, Edinburgh. Crown octavo, cloth, pages 480, 264 illustrations. MacMillan Company; New York, 1913. $3.25 net.

This little volume is a practical and concise attempt to place the essential facts of obstetrics before the student in an easily accessible form. The author possesses to a rare degree the faculty of expressing much in few words. His style is simple, vigorous, and pleasing. His teaching is convincing and safe.

THE CHILD, ITS CARE, DIET, AND COMMON ILLS. By E. MATHER SILL, M. D., Lecturer in Diseases of Children at the New York Polyclinic Medical School and Hospital; Attending Physician at the Good Samaritan Dispensary and Assistant Attending at the New York Polyclinic Hospital, pp. 207. Small octavo. New York: Henry Holt & Company, 1913.

This is a well-written, sensible, up-to-date little book for the young mother who wishes to intelligently take care of her child. It does not trespass on the field of the physician and its teaching is sound.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS

The Etiology and Treatment of Uterine Hemorrhages.—Hirsch (*Monatschr. f. Geburtsh. u. Gynäk.*, April, 1913) calls attention to the unsatisfactory status of our knowledge of uterine hemorrhage not related to pregnancy. He considers that the chief factor in the production of uterine hemorrhage resides in the contractility of the uterine musculature rather than in the endometrium. Two components are essential in the production of such hemorrhages: 1. hyperemia, which involves not only the uterus but the rest of the pelvic organs, and 2. an insufficient power of the uterine muscles so that the latter are unable to contract sufficiently to return the blood through the venous channels to the heart. This uterine insufficiency seems to show that the hemorrhages are due to functional disturbances of the uterine musculature but may also be traced in a large number of cases to anatomical changes in the uterine wall. In view of this etiology only those therapeutic measures are of avail which directly stimulate contractions of the uterus or affect the hyperemia which may be present. Hirsch considers that ergot is the most efficient remedy for the purpose and recommends that instead of intermuscular injections or oral administration it be given directly into the musculature of the uterus. He has used it in this manner in over 200 cases with good results, which vary however with the individual patient. In some cases the first injection stopped the bleeding, in others the treatment had to be repeated for three or four successive days. The result was especially well-marked in cases where tampons and curetting had been without effect. The injections are contraindicated in the presence of large fibroids although the small interstitial variety does not contraindicate this treatment. The injection should not be employed in the presence of acute inflammatory disturbances in the uterus or adnexæ and it is essential that the cavity of the uterus be completely empty. It is of especial benefit in the preclimacteric stage and chronic nephritis. In case an extensive connective tissue change is present in the uterus very little can be expected from the method. Subinvolution is very favorably influenced. The injection is made in the musculature of the cervix, from 1.4 grams of a suitable ergot preparation being employed.

The Toxicity of the Urine in the Puerperium and Eclampsia.—A. Zinsser (*Zentralbl. f. Gynäk.*, April 5, 1913) presents the results of a careful study of biological tests made with such urine, to determine whether a disintegration of albuminoids had resulted in the parent, which according to Pfeiffer, produces an anaphylaxis. The urine to be tested was injected into the peritoneal cavity or the circulation in a series of guinea-pigs but the results did not confirm the observations of Pfeiffer, who claimed that in toxic states due to the disintegration of albuminoids, the poison is excreted in the urine and will produce well-marked symptoms in guinea-pigs. Zinsser also tested out nine eclamptic cases in this manner with a negative result. In no cases did the death of the animal occur after the intravenous injection of eclamptic urine. The lowered temperature in these cases he believes is neither constant nor characteristic and has no connection with the clinical cause of the disease. As the result of his observations Zinsser claims that there is nothing to warrant the assumption that a parental *disintegration* of albumin results in either normal pregnancy or eclampsia.

Uterus Bicornis as the Cause of Transverse Presentation.—Klein (*Zentralbl. f. Gynäk.*, March 29, 1913) calls attention to the possibility of such malformations in the uterus as the most frequent cause in this abnormality, particularly where it recurs repeatedly in the same patient. In one of the two cases which he reports there were seven and in the other eight successive transverse presentations requiring operative treatment. In one of these a Cesarean section was finally done because of the previous still-births resulting from breech extractions. There were no other anatomical factors present in either case to produce the malposition. The author thinks that the prognosis in these types of uterine deformity is not unfavorable, if proper supervision and assistance is extended sufficiently early. It is quite probable that in any case where such a malposition has occurred it will be repeated in later pregnancies.

Treatment of Eclampsia by Lumbar Injections of Normal Serum.—Mayer (*Zentralbl. f. Gyn.*, March 1, 1913) reports a second case in which the serum of a normal pregnant woman was used for this purpose. In the present instance the child of a mother with mild eclampsia was seized with severe convulsions and death was expected. A lumbar puncture was done and 5 c.c. of fluid abstracted, followed by the injection of the same quantity of normal blood serum from a healthy pregnant woman. An immediate improvement in the symptoms resulted, the cyanosis was relieved and only a few slight convulsions subsequently occurred. The child died, however, in a few hours with evidences of increasing cardiac weakness. The author commends the method for further trial.

Normal Pregnancy Serum in Hyperemesis.—Rubeska (*Zentralbl. f. Gyn.*, March 1, 1913) reports two cases in which a thorough trial of the serum was made but a complete failure resulted so that it became necessary to interrupt the pregnancy. The writer believes that the remedy is too uncertain to be of value.

The Estimation of the Length of Pregnancy.—Schottlaender (*Zentralbl. f. Gyn.*, February 8, 1913) has attempted to determine the length of the pregnancy by a histological examination of the placenta. The material examined was divided into three groups corresponding approximately to the three trimesters of pregnancy and the results were compared with data obtained by careful measurements of the fetus. In examining early placentae the presence of nucleated red cells in the vessels of the villi and chorionic membranes can be definitely established before the twelfth week. A number of other distinctive differences in the character of the villi also exist in subsequent months of pregnancy although from the sixth to the tenth month no practical histological criteria could be established. It is necessary to rely on a collective diagnosis rather than on any histological features in the placenta.

Lumbar Injection of Magnesium Sulphate in Eclampsia.—Rissmann (*Zentralbl. f. Gyn.*, February 8, 1913) believes that therapeutic measures in eclampsia should be directed principally to the brain and spinal canal as being the center of the disease. In view of the good results obtained by such treatment in other convulsive seizures, he believes that in severe cases the injection of magnesium sulphate into the spinal canal is indicated. In his case 5 c.c. of a sterile 15 per cent. solution were injected by lumbar puncture and no further convulsions occurred. On the third day the patient seemed entirely well. The birth of a small child during this period had had no effect upon the convulsions.

Disadvantage of the Lateral Position in Delivery.—Westphalen (*Zentralbl f. Gyn.*, February 22, 1913) calls attention to the possibility of an endogenous infection resulting in cases of rapid delivery conducted in the lateral position where the patient is not turned over on her back immediately after the birth of the head. Westphalen has observed that in such cases a change in the position or pressure on the uterus results in the extrusion of air bubbles from the genital canal. He believes that this results from negative pressure in the tract with the consequent entrance of air. He is convinced that the later may include infectious material from the vulva and that this is apt to be drawn up into the higher parts of the canal. For the above reasons Westphalen believes that in every instance where a woman is delivered on her side a return to the dorsal position should be made as soon as the head is born.

GYNECOLOGY AND ABDOMINAL SURGERY.

Radical Abdominal Operation for Cancer of the Uterus.—Regarding the operability of cases of carcinoma of the cervix, W. Weibel (*Surg. Gyn. and Obst.*, 1913, xvi, 251) says that in fourteen years 1,430 cases were examined in Wertheim's clinic; seventy-one of these refused the operation, 684 were considered inoperable, and 675 were subjected to the radical abdominal operation, giving an operability of 50 per cent. The after-results of Wertheim's operation were 160 cases free from recurrence out of 380 operated upon. As to the absolute efficiency, 863 cases with cancer of the cervix were examined in this five-year period, thirty-six of them refused the proposed operation, and eight died from intercurrent diseases; of the rest (819) 160 cases were well and free of cancer, showing 19.5 per cent. absolute efficacy. With these results we can say that the radical abdominal operation for cancer of the uterus cured permanently a fifth of all the cases examined in the clinic, 43 per cent. of all operated, and 53 per cent. of all cases surviving the operation. In the last 175 operations the primary mortality has been reduced to 9 per cent.

The Cautery in Treatment of Cancer of the Cervix.—After describing the technic of this method X. O. Werder (*Surg., Gyn. and Obst.*, 1913, XVI, 272) discusses its remote results. In thirty-nine cases five years or more have elapsed since operation. Twenty-one of these were vaginal igni-extirpation and eighteen combined. Of these, eighteen have survived the five-year limit, or 46 per cent. Five of these, however, have died since—one after six years from an intercurrent disease, and four from recurrence. That four deaths, 22 per cent., have occurred more than five years after operation would seem to necessitate an extension of the period of safety beyond five years. There are at present living and well thirteen cases, 33 1/3 per cent. Of these, three have lived eight years and more since the operation; three, seven years and more; two, over six years, and five, five years and over. Nine of the survivals were cases of vaginal igni-extirpation, and four combined. This leaves twenty-one cases whose death occurred within five years of operation, including the two operative deaths. Of the nineteen patients who survived the operation twelve are known to have had a recurrence, the seat of recurrence being local in two, and in the inguinal, iliac and lumbar glands in ten. Two deaths were due to intercurrent disease and in five cases cause of death in unknown. Death occurred within one year in seven, in two years in four, in three years in five, in four years in three. Eleven patients were less than forty years of age; of these only one is living at present. This seems to confirm the finding established by a number of experienced operators—that in carcinoma of the cervix, at least, age is of considerable importance from a prognostic point of view. Patients who have passed the menopause or are very close to that period are more favorable subjects for treatment than those during the height of their sexual activity. There seems to be no doubt that lymphatic extension occurs much earlier and more rapidly in young patients than in the old, and this probably accounts for the difference in the prognosis.

Relation between Sarcoma and Myoma of the Uterus and its Bearing on X-ray Therapy of Uterine Myomata.—J. R. Miller (*Surg. Gyn. and Obst.*, 1913, xvi, 315) finds that collected statistics show that sarcoma occurs in about 2 per cent. of all myomatous uteri. The primary mortality of the operative myoma therapy is still about 4 to 5 per cent. A lasting cure of sarcoma of the uterus by the operative treatment can be expected in only 25 per cent. of the cases at most. Considering the advantages of the *x*-ray over the operative treatment in regard to assured freedom from fatality, mistakes in the diagnosis of sarcoma amounting to 0.8 per cent. make little difference. The writer believes that a routine operative treatment of myoma of the uterus, for fear of sarcomatous degeneration, need not be carried out.

Red Degeneration of Uterine Fibromyomata.—The remarks of J. L. Smith and W. F. Shaw (*Jour. Obst. Gyn. Brit. Emp.*, 1913, xxiii, 129) are based upon the examination of twenty-four specimens and the publication of Leith Murray in which he brought forward evidence to prove the hemolytic action of lipoids in these red fibromyomata. They say that uterine fibromyomata of a red color are divided pathologically into two classes, thrombotic and angiomatous. The thrombotic are of a deep red color, which is not lost in Kaiserling solution, nor is there any free blood on a cut surface nor in the tissues. The thrombotic exhibit various degrees of thrombosis: the early ones showing only a collection of thin threads around the walls of a few vessels, while the late ones have all the vessels plugged with them. The thrombotic have clinical symptoms of abdominal pain, tender tumor, rapid enlargement of the tumor, general ill-health, rise of temperature and pulse-rate; these symptoms may occur singly or in combination. All the thrombotic fibromyomata contain a large quantity of fat due to the retardation of the circulation by the thrombosis of the blood-vessels. The red color of the tumors is due to the hemoglobin staining associated with the action of the accumulated fat. The majority of the specimens in this group contain a large number of thin-walled vessels: in this respect the two groups are similar. The angiomatous group contains large numbers of thin-walled vessels. These vessels are filled with red blood corpuscles: in some specimens the congestion is further advanced and free blood is found in the tissues (hemorrhage). The color of these specimens is bright red and tends to fade in the preservative fluid. It is due entirely to the large amount of blood in the tissues, and not to hemolysis and hemoglobin staining. The patients do not have any clinical symptoms other than bleeding and a feeling of weight due to the presence of the tumor.

Inconveniences of Conservative Surgery of Ovarian Cysts.—Silhol (*Arch. mens d'obst. et de gyn*, April, 1913) questions whether we are justified in risking the necessity of performing a second operation for removal of portions or the whole of an ovary left in position for conservative methods. A second operation is so frequently required for the removal of the other ovary that the patient is often disappointed by the results obtained. We must consider not only the malignancy of vegetating ovarian cysts but also of the simpler ones. Every ovarian cyst is a potential malignant tumor. On the other hand malignant ovarian tumors give us agreeable surprises being very slow to generalize. This appears to be because the ovaries are organs that have a firm consistency in which infection does not travel easily; they are also organs of internal secretion, all of which resist cancer for a long time. Cancer begins in them as the secretion diminishes and function passes away. One ovary being involved, the propagation to the other may vary in rapidity anatomically since there is no communication between the two ovaries. The lymphatics of the ovaries do not communicate with one another. With a malignant tumor of the two ovaries there exist generally other malignant tumors of stomach, or intestine, all arising from the same cause. All ovarian tumors tend to bilaterality. This is especially true of the malignant variety. Bilaterality is considered a factor in the gravity of the affection. The author believes it imprudent to leave an ovary even if apparently normal in a case of operation for ovarian cyst. Conservative surgery is allowable in case of inflammatory changes, but not of neoplastic lesion. It is imprudent to apply conservative surgery to ovarian cysts, no matter how attractive the proposition may appear. If the cyst is malignant, and one can never tell about this, the patient is left a prey to recurrence and generalization of the process, which is imprudent and often regretcble in its results.

ITEM.

CLINICS, DEPARTMENT OF PUBLIC CHARITIES, NEW YORK CITY.

Calendar for August, 1913.

City Hospital.—Obstetrics, Dr. Dorman, Wednesdays, 2:30 P. M.

Cumberland Street Hospital (Brooklyn).—Gynecology, Dr. Pierson, Wednesdays, 2:30 P. M.

Coney Island Hospital.—Pediatrics, Drs. Beck and McQuillan, Wednesdays, 3:30 P. M.

Coney Island Hospital.—Pediatrics, Drs. Pendleton and Van Wart, Wednesdays, 3:30 P. M.

City Hospital.—Gynecology, Dr. Child, Thursdays, 2:00 P. M.

Coney Island Hospital.—Gynecology, Drs. McEvitt and Mills, Thursdays, 10:30 A. M.

Coney Island Hospital.—Gynecology, Drs. Mayne and Rankin, Thursdays, 10:30 A. M.

City Hospital.—Obstetrics, Dr. Dorman, Fridays, 2:30 P. M.

Kings County Hospital (Brooklyn).—Gynecology, Dr. McNamara, Saturdays, 1:30 P. M.

All registered physicians, visiting and resident, and medical students are cordially invited to attend these Clinics. Cards of admission, valid until October, 1913, may be obtained at the Academy of Medicine, 17 West 43d Street, Manhattan, and at the Medical Society of the County of Kings, 1313 Bedford Avenue, Brooklyn, as well as from the Secretaries of the several Medical Colleges.

DEPARTMENT OF PEDIATRICS.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON PEDIATRICS.

Meeting of April 10, 1913.

HENRY DWIGHT CHAPIN, M. D., *in the Chair.*

HYDROCEPHALUS TREATED BY CISTERNA-SINUS DRAINAGE.

DR. IRVING S. HAYNES reported the case of a child thirteen months old upon whom he had operated for hydrocephalus on February 8. The case was typical, with the large head, open fontanels, spastic extremities, and continuous cry and whine.

Cisterna-sinus drainage with a silver cannula was performed as described in a paper read before the Surgical Society in January and published in the *Annals of Surgery* for April. The aim was to direct the cerebrospinal fluid from the subarachnoid spaces into the blood stream by way of a sinus, imitating the course the fluid took normally.

The operation consisted in exposing the occipital bone from the external occipital protuberance toward the foramen magnum and in removing a gutter of bone 1/2 inch wide and 1 1/2 inches long to uncover the dura over the confluence of the sinuses and the cisterna magna.

A connection between the two spaces was established by a silver cannula having an internal diameter of 1 1/2 mm., a long arm about 1 inch in length, and a short arm of 1/4 inch. These arms stand at right angles to each other, the tube being bent on a short curve. The ends of the cannula are cut obliquely.

The long arm of the tube was inserted through a tiny incision into the left lateral sinus, in this case, and the short arm thrust through a similar incision into the cisterna magna and a previously placed retention suture tied over the tube to hold it in position. After the tube was in place there was no leakage of either blood or cerebrospinal fluid and the skin incision was closed tightly. Dr. Haynes presented diagrams illustrating the steps of the operation and two *x-ray* photographs, one taken twelve days and another fifty-six days after the operation, both showing the tube in position, and the last that new bone was forming to close up the gap at the site of the operation.

The postoperative course was interesting. Within the first twenty-four hours the temperature reached 106, the pulse could not be counted and the respirations were 42. There were general muscular contractions but no convulsions. Under mustard baths and intermittent cold colonic irrigations the temperature had fallen to 100. On the 10th the pulse was 128. Convalescence was thereafter uneventful.

Measurements of the head on April 5 showed that the circumference had diminished 1 1/4 inches; the distance from the nasion to the inion in the mid-line was only 1/4 inch less; while the distance from one external auditory meatus to the other had lessened 1 1/8 inches.

DISCUSSION.

DR. MARSHALL CARLETON PEASE, JR., said that he had seen the patient presented by Dr. Haynes when the child was first brought to the clinic. There was no question about the patient having hydrocephalus. The mother asked what could be done for the baby and she was told nothing could be done medically and probably very little surgically. Since Dr. Haynes had operated there had been a distinct lessening in the spasticity. Personally, he looked upon the case as being a remarkable one. Over two years ago he was told that surgery should be able to do something for these cases of hydrocephalus. The patient presented was certainly much better than when he first saw it.

DR. CHARLES HERRMAN had seen the patient presented by Dr. Haynes at the Vanderbilt Clinic before the child was taken to the Hospital and that in addition to the change in size of the head there had been some improvement, although the improvement was not very great. The child had had hydrocephalus for many months. The condition had come to a standstill. After lasting for so many months one could not expect to obtain much benefit from any surgical procedures. One could remove a certain amount of fluid but the damage to the brain was such that one could not to any great extent improve the child's condition. The child's mentality was practically the same as before the operation. There was no question but that the size of the child's head had been diminished, but he doubted whether there would be much improvement in other respects. In a certain number of cases of hydrocephalus lumbar puncture would do some good. In the patient present the conditions were not favorable for any marked improvement because of changes which had already taken place in the nervous system.

DR. HAYNES, closing the discussion, said that all recognized the fact that a proposition of this kind was experimental. Surgery alone offered a chance for patients afflicted with hydrocephalus but it had failed in the past. Perhaps in the case presented the patient would have gotten well without surgical interference but there were no reasons for such expectations. All that he claimed for this work was the following: First, there had been a distinct diminution in the size of the head. Second, there had been a marked diminution in the intracranial pressure. Third, the child's entire attitude had changed. Fourth, his spasticity was less. It was interesting to note that when he was constipated, his spasticity increased. Hearing seemed to be normal, for the child turned his head when spoken to. The child's intelligence or mentality had apparently been bettered; he remained comparatively quiet and did not whine and cry as before. With regard to lumbar puncture, the results in these cases were negative except in the nine cases reported by Bókay.

SIMPLE SYRINGE TRANSFUSION WITH SPECIAL CANNULAS. A NEW METHOD APPLICABLE TO INFANTS AND ADULTS. PRELIMINARY REPORT.

Dr. Edward Lindeman presented this apparatus which consisted of two sets of cannulas, two tourniquets, and twelve syringes. Two sets of cannulas were employed, one for the donor, the other for the recipient. There were three cannulas to each set, and each telescoped within the other. The innermost cannula was practically a hollow needle, long gauge, with one end ground to a fine point and short bevel. The hollow needle was fitted snugly into cannula No. 2 which was shorter than the needle and fitted snugly in cannula No. 3 which was shorter than cannula No. 2. The proximal ends of No. 1 and No. 2 were capped with stationary thumb-screw caps. The proximal end of No. 3 was capped with a receiver to fit any record syringe. The caliber of No. 3 was the same as the tip of a record syringe. In very small infants with very small veins only No. 1 and No. 2 were employed, No. 2 being capped with a receiver to fit the syringe. The syringes used were record syringes of new improved type with a capacity of 20 c.c. and could be sterilized by boiling.

Operation.—One operator managed the syringe of the recipient; another operator managed the syringe of the donor. An assistant stood between the operators and the operators were in a position close to the assistant. The donor and recipient were placed in the recumbent posture and suitable veins were selected. In adults and most children over two years of age the median basilic was easily accessible. In infants the external jugular or one of its tributaries was entered most advantageously. In some cases the internal saphenus might prove the vein of preference. The tourniquet was placed in position, and the skin was sterilized with iodine. The cannula was then held in a position almost parallel to the vein with the thumb on the thumb screw cap of the innermost cannula. The skin was then punctured and the cannula was forced into the vein. After the first joint had entered the vein, cannula No. 1 was withdrawn a distance of about 1/2 inch; this prevented the vessel wall from being injured or punctured by the needle after the vein was entered. With the thumb now on the thumb-screw cap of No. 2

the cannula was forced further in until the second joint had entered the vein. Cannula No. 2 was then withdrawn a distance of about 1/2 inch. (Cannula No. 3 alone could come into contact with the vessel wall.) This cannula was then gently pushed into the vein to a desirable length, usually 3/4 to 1 inch sufficing. Cannulas No. 1 and No. 2 were now withdrawn entirely. If the vein had been successfully entered blood would flow through the cannula. When the first drop appeared a syringe containing warm saline solution was immediately attached and a very slow flow of saline was maintained through the cannula. The escape of blood was thus prevented. There was no need of haste at this stage. A cannula was next inserted in the vein of the donor in a like manner; and again a syringe containing warm saline was attached and loss of blood thus prevented. Everything was now in readiness for the transfusion. An empty syringe was substituted for the one containing saline solution and blood was withdrawn from the donor as rapidly as possible. When the syringe was full, the assistant passed it to the operator on the recipient, who removed his saline syringe, attached the syringe containing blood, and evacuated the contents gently but speedily into the vein. One syringeful of blood was followed by another in rapid succession until the desired quantity of blood had been transfused. It had been found advisable for the assistant (or third man) to remove the syringe from the cannula of donor as soon as filled. The operator could thus hold the cannula in place with one hand while with the other hand he might at once adjust an empty syringe into the cannula. Loss of blood was thus reduced to a minimum.

Rules and Comments.—1. Bright polished surfaces of syringe and cannulas were requisite.

2. A syringe used once should not again be employed until thoroughly cleaned with sterile water.

3. Air must be avoided. This, however, offered no difficulty.

4. Tourniquet of patient must be removed after vein was entered with cannula.

5. Tourniquet remained on donor throughout the operation; momentary release of tourniquet might be advisable once or twice during the course.

6. Dexterity and speed were requisites for success.

7. Syringes could be evacuated more rapidly than they could be filled without any harmful effects. This difference in time allowed for attachment of syringe with warm saline every now and then, thus preventing clotting.

The time elapsing in filling and evacuating the syringe was so brief that blood did not undergo any alteration from donor to donee. No lubricant had been employed except in one case. It seemed to make little difference. However, there was no objection to a film of albolene coating the syringe. Both arms of the donor might be used simultaneously. Larger syringes with larger calibered cannulas might be used but the present sizes had worked satisfactorily and the fittings of syringe and cannulas were of universal gauge. Syringes and cannulas might be kept sterile in individual metal containers.

They were thus in readiness for immediate use and no preparation for operation was required. The same vein could be used repeatedly for subsequent transfusions, since no thrombosis nor permanent injury to the vessel occurred. Any quantity of blood could be transfused and the quantity was definitely measured at the time of transfusion. Rubber tubings, various pumps and gravity had been employed on animals but the best results had been obtained with the syringe cannula method. In a later paper Dr. La Fetra and the writer would present some new fields of application of blood transfusion, and cases would be discussed in detail. The object of the present paper was simply to present a new and simple method of blood transfusion.

RADIOGRAPHIC STUDIES OF THE CHEST IN TUBERCULOUS MENINGITIS.

Dr. L. O. Woodruff read this report which was based on fifteen cases of tuberculous meningitis from the childrens' medical wards of Bellevue Hospital. He stated that the idea of the routine examination of the chests suggestive of tuberculous meningitis suggested itself to him from a study of the plates taken in a number of cases of suspected early pulmonary tuberculosis. It seemed that tuberculous meningitis might give a series of cases ideal for this purpose, as a fair proportion would probably go to the necropsy table. A study of the autopsy records showed that there existed in the chest all stages of tuberculous infection, from, rarely, the mere involvement of the lymph nodes to a general miliary infiltration of both lungs. It could thus be learned whether the *x*-ray could be relied upon to diagnose early tuberculous infection of the bronchial glands and early infiltration of the lungs, and also to what extent in those cases showing pulmonary involvement the interpretation of the radiographic shadows corresponded with the pathological lesions present.

Moreover, since autopsy records showed a pulmonary involvement beyond incipiency in 88 per cent. of the cases, it seemed that a routine radiographic examination of the chest—in hospital work at least—might prove to be of real value in diagnosis, especially in those cases in which the absence of a skin reaction and the inability to demonstrate the tubercle bacillus in the spinal fluid, left the diagnosis open to question. A search through 285 cases of tuberculous meningitis over a period of eight years yielded only twenty-six autopsies, twenty-three, or 88 per cent. of which showed considerable pulmonary tuberculosis. However, the von Pirquet and the spinal fluid were both negative in the same child in five, or 33 per cent. of the fifteen cases which form the basis of this report.

The reports of the radiographic findings of the chest were: no tuberculosis in one case; tuberculous glands and some involvement of the right lower lobe in two cases; more or less extensive involvement of one or both lungs in twelve cases, or 80 per cent., a figure approaching rather closely to the necropsy findings cited above. In four of these twelve cases the von Pirquet and the spinal fluid were negative.

To check these up, there were six postmortem records, two of which were of the cases showing slight pulmonary and bronchial gland involvement. The other four were of cases in which radiographic reports of more or less extensive pulmonary involvement were rendered.

Group I.—Slight lesions were shown by x-ray in two cases. CASE I.—Age two years, nine months. Radiographic report: Area of infiltration of right root involvement, also right lower lobe. Also one or two shadows suggesting enlarged glands. Postmortem: slight congestion at bases. Lungs crepitant throughout. Bronchi contain a slight amount of mucopurulent material. No tuberculosis. Glands not enlarged and not tuberculous. In this case the lower cervical glands were enlarged and caseous. CASE II.—Age six years. Radiographic report: pulmonary lymph nodes enlarged. From the very distinct markings probably a tuberculous bronchopneumonia in the right lower lobe. Postmortem: lungs and lymph nodes negative, show no tuberculosis.

Group II.—Radiograph examination shows marked lesions. Four cases. These cases in which the above radiographic diagnosis was made, all showed extensive pulmonary involvement postmortem. The plates were highly instructive and interesting.

A study of all the cases suggested that the interpretation of the radiographic shadows in the chest in children and infants when there was considerable tuberculous involvement of the lungs, could be relied upon, at any rate to diagnose the nature of the pathological process. Consequently, as there was usually considerable pulmonary involvement in tuberculous meningitis, this measure might be a distinct aid in the diagnosis of this disease; particularly in those cases in which the diagnosis was not absolutely certain owing to the failure to find the tubercle bacilli in the spinal fluid, and in which the strongly corroborative evidence of a positive von Pirquet reaction was lacking.

It would also seem likely from a study of cases one and two that in children in whom, on clinical grounds, there was uncertainty regarding the presence of an early tuberculosis involvement in the chest the x-ray could not be considered a deciding factor in the diagnosis; nor could it be relied upon even in more advanced cases to furnish accurate evidence of the exact pathological lesion present.

However, these conclusions were merely suggestive, this paper was only a preliminary report, and the conclusions must of necessity be of comparatively little value until supported by much more extensive observation.

THE PROGNOSIS OF TUBERCULOSIS IN INFANCY AND AN ACCOUNT OF A WARD EPIDEMIC.

DR. ALFRED F. HESS read this paper. He said that tuberculosis in infants under two years of age was considered almost invariably fatal, a fact that had been brought out recently by a number of observers. Dr. Hess reported a number of cases which he had followed for a number of years.

Seven infants had been followed for three or four years. These infants had been surrounded by cases of tuberculosis in their homes; clinically they were perfectly well.

Another group of cases had been followed at the Hebrew Infant Asylum; in this group were 300 infants under the age of five years. In all these infants the v. Pirquet reaction was made and all had been reported as being very well.

A third group of infants had been fed on milk found to contain tubercle bacilli. He had reported on this group two or three years ago.

Still another group which he reported appeared at the Preventorium for Tuberculosis. These infants were surrounded by tuberculous adults in whom the tubercle bacilli could be proven.

Dr. Hess summarized as follows:

Tubercle bacilli were not necessarily fatal to young infants. They have some resistance to these organisms even when they are less than six months of age. As the result of observing this large group of infants all of whom were less than two years of age, and some less than six months, Dr. Hess concluded that latent tuberculosis may exist in earliest infancy and that the prognosis is not always fatal. He had been able to follow these infants for from four to five years and found them in most cases well. However, clinical tuberculosis in infants was fatal when involving the internal organs.

Dr. Hess also reported on the infection of a ward of ten infants who were placed in contact with a tuberculous nurse for six weeks. Seven of these infants gave negative tests before this nurse took charge, and a positive v. Pirquet reaction soon after she was removed from the ward. The infants did not leave the precincts of the asylum, and were not subjected to tuberculous infection in any other way.

HELIOTHERAPY AS SEEN IN ROLLIER'S CLINIC.

Dr. I. S. Hirsch presented this paper. He said that Leysin, a village in the southwestern part of Switzerland at an elevation of 4,000 feet, had exceptional climatic conditions of intense sunlight, dry atmosphere, freedom from dust and insects, but little wind, a moderate warmth in summer, and not too great a cold in winter, thus permitting isolation during the winter as well as summer and making possible uninterrupted life in the open air.

Dr. Rollier, in 1903, inaugurated there the first clinic for the exclusive treatment of surgical tuberculosis by sunlight. The feature of his sanitorium treatment was the treatment of surgical tuberculosis at an altitude with the application of local and general insolation during winter as well as summer.

So successful was he, so remarkable the results of his treatment, and so numerous the cases referred to him, that three clinics, accommodating about 300 patients, had to be built. Charges ranged from seven to ten francs per day.

One of the hospital buildings containing about eighty beds for children and adults, built in accordance with the most approved ideas of hospital construction, stood on the mountain side overlooking the village of Aigle, and, like the other buildings, faced south and was protected from the winds of the north and east by the hill upon which it stood. It was almost entirely surrounded by fir and ash trees, but in such a manner that it still received the full value of the sunlight at all times of the day. Large and spacious balconies were provided on three sides of the building, so that all the beds in the interior might be wheeled out through the wide windows which were constructed without ground sills. All the patients' rooms faced south. By means of large folding doors the wards might be completely exposed, not only to the south but also to the east and west. On sunless days and at night the airing was continued in this way, the occasional wind or storm being shut out by means of these doors. When the sun shone, the beds in the early morning were pushed out upon the balconies, from whence the view was beautiful.

The treatment instituted by Rollier consisted first of the general exposure of the entire naked body and second of the localized exposure of the particular site of the disease to the sunlight without any intervening lenses or glass. When the days were cloudy and there was no sun, a simple exposure of light and air was carried out, but the patients were partially clothed. Individuality was the watchword of his treatment based on the general principles stated.

When the patients had accommodated themselves to the new environment, which took from several days to three weeks, an exposure to the sun was given, beginning with the feet and gradually extending upward, until, at the end of eight days, the chest was reached. The parts were exposed a few minutes every other day, then several times a day. First feet and ankles, then ankles and knees, then thighs, and thus part by part until the entire body was pigmented. It was only then when the entire body was pigmented that a general exposure was given.

It was absolutely essential for the success of the treatment that no dermatitis should occur. The eyes were protected from the direct light of the sun. The period of exposure to the sun of the entire body was gradually increased, from two to four hours once or twice a day, then to four to five hours once or twice daily. Even when the maximum exposure was given there were two hours during the day when the patient was removed from the sunlight.

Under this exposure the skin became markedly pigmented, turning to a very dark brown color. An early advent of this pigmentation was a sign prognostic of good results. Blondes did not respond, nor did they bear the sunshine as well as brunettes and they required longer treatment. The pigmentation was considered to play a very important rôle in the treatment because it was believed that it lowered the resistance of the skin to the passage of the light rays, and modified the heat rays so as to remove the possible harmful effects, for the heat of this intense sunlight might be exceedingly harmful. The exposure to the sun caused also an hypertrophy of the skin itself, increased its vitality and resistance and protected the organism against extremes of temperature; such conditions as acne or furunculosis are never seen in patients so exposed. In winter, when there is at least one meter of snow on the ground and sometimes two, those children lie about naked in the sun on the balconies and those that were well enough to walk wandered about naked in the sunlit snow, the radiations from the snow being so intense that the temperature in the sunlight was 50° to 60° C., while at the same moment it might be 0° in the shade.

After general pigmentation had been obtained the rays were applied locally to the site of the disease whether it was the hip, knee, or spine. At first only for about five minutes per day, then two to three times a day, then ten to fifteen minutes, then, finally, for a period of two to six hours. The joint was usually immobilized by means of counterweight extension. When immobilized by a plaster jacket an opening was cut in the jacket in the front and back to permit the exposure of the affected parts to the sun.

The first local effect of the sun's rays was an analgesic one which was produced with remarkable rapidity and quickly permitted the removal of the fixation apparatus.

In the treatment of caries of the spine, the patient received half the sunlight treatment on the back over the kyphosis and half on the abdomen for the treatment of the abscess. When suppuration with sinus formation was present, sinuses were not treated antiseptically or surgically but exposed directly to the sunlight. Sequestra were extruded without any surgical assistance and the fungus granulations were absorbed. The wounds healed with soft pink scars. The thing that impressed one at Leysin is the excellent health of all exposed to the sunlight, and the rapidity with which, aside from the general condition, the local condition improved. The patients arrived there usually emaciated, anemic, racked with fever, with numerous joints involved, and the condition frequently complicated by discharging sinuses, the cases of all being of the worst kind, those which have been practically given up as hopeless after every other method of treatment had been tried. Yet, after several months' sojourn in this climate under this routine, they took on weight, the muscular atrophy disappeared, the skin became smooth and glossy, the temperature fell, and the blood condition improved. The demonstration of Dr. Rollier's results, as controlled by photograph and radiograph, was convincing even to the most skeptical. All forms of peripheral tuberculosis were thus treated also peritonitis, cystitis, adenitis and all forms of intestinal tuberculosis.

Rollier applied this method to the treatment of patients with tuberculosis of the sternum and the ribs which was practically inoperable from a surgical standpoint, but which might be cured after a year's treatment by this means.

The most wonderful result of all, perhaps, was the reformation of the joint after almost complete destruction and ankylosis. This effect upon the joint was apparent early in the treatment. The limb itself, distorted and swollen, returned to its normal form. In many of these cases the radiograph upon admission showed that the entire form of the bone was completely gone, with only a vestige of the periosteum remaining, yet one year later the bone was entirely reformed and in an almost normal condition, with the joint outline distinct. The scars upon the joints in many of the cases were the tell-tale marks which indicate the condition before treatment.

Rollier's results spoke for themselves. About 90 per cent. of the cases were cured. In one and one-half years, out of sixty cases of tubercular joints, fifty-four were healed, five improved, and one died. Of sixty cases of tuberculosis of the bones, fifty-four were healed, five improved, and one died. Of forty-five cases of tubercular peritonitis, thirty-two were healed, five improved, one remained stationary, while four died. Of eighty-eight cases of tubercular lymph nodes, eighty-one were cured, six improved, and one died.

The effects were undoubtedly due to the proper application of the sun's rays and all other factors were but adjuvants to the treatment. Under the general effects of the exposure might be considered the vasomotor excitant effect on the skin reacting on the internal circulation resulting in an increased metabolism. The pigmentation and hypertrophy affected the condition of the red blood-corpuscles, raised the hemoglobin index and increased the number of the cells themselves. The local effects were the well-known bactericidal effect of the sunlight on the tubercle bacilli and pus cocci, etc., and the infra-red and ultra-violet rays which have undoubted chemical and heat effects. It was to the ultra-violet rays that Rollier ascribed the greater part of the results achieved. Rollier insisted upon the importance of allowing nothing to interfere between the exposed surface of the skin and the sunlight. This was founded upon the physical principle that the thinnest sheet of glass would completely absorb the violet rays. On dark or stormy days the wounds were treated by either the *x*-rays or Cooper-Hewitt light both containing ultra-violet rays.

TUBERCULOSIS ACQUIRED THROUGH CIRCUMCISION.

Dr. L. Emmett Holt read this paper. He stated that tuberculosis by direct wound inoculation, while not a frequent method of contracting the disease, had yet occurred often enough to demonstrate that this was a real danger. In 1887, Willy Meyer collected a number of such instances and added the report of a case of his own in which tuberculosis was acquired through ritual circumcision. While many observations had been made on this subject since that time the report of only two cases had come to his notice in this country, one by Ware, and one by Sara Welt-Kakels. From inquiries, however, he had been led to the opinion that many cases occurred which did not find their way into print.

The case here reported was of more than ordinary interest by reason of the virulence of the infection and the fact that death occurred at an earlier age than any case which the author had found on record.

The patient, a baby three months of age, was admitted to the Babies' Hospital on February 24, 1913, with an extensive ulceration of the penis. The child was one of seven, four of whom had died from acute diseases. The parents were healthy as were the other living children. The infant was reported to have weighed 11 pounds at birth and had been breast fed up to the date of admission. When eight days old ritual circumcision had been performed, the blood being sucked in the usual manner. The wound did not heal properly and at the end of a week suppuration was present and ulceration followed which had gradually extended up to the time when the infant was brought to the hospital. About two weeks after the operation glandular swelling was noticed in the groin. These swellings had gradually increased in size although they showed no tendency to suppuration. The digestion had been good and the nutrition well preserved until three weeks previous to admission, since which time there had been a steady loss in weight, refusal of food, slight fever, and cough. There was a discharge from one ear and from the nose. Four or five days previous to admission there had been a scanty maculovesicular eruption over the trunk and extremities. At the time of admission the infant weighed 11 1/2 pounds and did not appear acutely ill. Scattered over the body were fifteen or twenty lesions resembling those of varicella. None were seen on the hands or feet and none on the mucous membrane. These lesions were 3 to 4 millimeters in diameter, vesicular at the periphery, and crusted at the center. A very narrow zone of redness surrounded them. Many râles were present over both lungs, but there were no signs of consolidation. The heart was normal, the abdomen distended, and the spleen much enlarged, reaching fully 2 inches below the costal margin. The liver was also markedly enlarged, reaching 3 inches below the costal margin. There was a chain of nodular swellings in the inguinal region on both sides. The penis showed complete destruction of the skin by ulceration quite to the abdominal wall and the base of the scrotum. At the meatus was quite a deep ulceration producing an appearance resembling a slight hypospadias.

The tuberculin test gave a strongly positive reaction. Tubercle bacilli were found in the discharge from the penis, in the sputum, and in the scrapings from the cutaneous lesions. The bacilli from the ulcers of the penis were carefully differentiated from the smegma bacilli

The child lived sixteen days after admission. During this period there was a constant temperature, varying between 99° and 101° F., but occasionally going to 102° or 103°. There was progressive weakness, increasing cough, and râles throughout the chest. The glandular swellings became larger but did not suppurate. The other external lymph nodes were not enlarged. The blood examination showed a leukocyte count of 16,000; polymorphonuclears, 85 per cent; lymphocytes, 14 per cent.; hemoglobin, 65 per cent. Just before death the leukocytes increased to 24,000, and the polymorphonuclears to 92 per cent. No cerebral symptoms were present, but there was considerable restlessness; lumbar puncture was done two days before death. Under normal pressure a clear fluid was obtained which gave a faint globulin reaction and showed an excess of cells. The skin lesions dried up slightly during the period of observation, but no new ones appeared.

The autopsy showed three or four tubercles in the brain over the base and a few over the convexity; the ventricles were not distended and there was no evidence of meningitis present. Both lungs were everywhere studded with miliary tubercles and small tubercular nodules. No part of the lungs had escaped. The bronchial and mediastinal lymph nodes were caseous but not very large and none showed softening. Examination of the heart showed a small yellow tubercle upon the coronary artery, a tuberculous nodule, 2 millimeters in diameter, was found in the wall of the right ventricle and a smaller one in the wall of the right auricle near the entrance of the superior vena cava. This involved the pericardium, endocardium, and cardiac muscle, and was cheesy. The parietal peritoneum was studded with miliary tubercles and tubercular nodules. The liver and spleen showed many large tubercles. The kidneys each contained small caseous tubercular nodules in moderate numbers, chiefly in the cortex. Both adrenals contained tubercular nodules and two were found in the pancreas. The stomach and duodenum were normal, but throughout the rest of the small intestine were great numbers of tubercular ulcers. The mesenteric lymph nodes were greatly enlarged and caseous. Extending upward from these was a chain of large caseous retroperitoneal lymph nodes which followed the iliac arteries. One of the iliac arteries contained a cheesy lymph node in its adventitia. The tuberculous character of this lesion was confirmed by microscopical examination. Three tubercles were seen on the mucous membrane of the bladder near its base. Both middle ears contained pus.

The man who performed the circumcision was examined. No physical signs of disease could be found in his chest, but he was a pale, thin, emaciated individual, who looked decidedly tuberculous. From his sputum two acid-fast bacilli were found which looked like tubercle bacilli. Thus the evidence of infection through the circumcision wound seemed conclusive. The lesions found at autopsy pointed strongly to a spreading of the infection through the lymphatic system beginning from the wound, and afterward a general blood infection. Dr. Holt called special attention to the lesion in the iliac artery and to the tuberculides of the skin, and said that he believed that the latter lesion was often overlooked. He had seen two other cases during the present season, both in young children.

The writer said he had collected reports more or less detailed of thirty-nine other cases of tubercular infection through circumcision. Of these forty patients, sixteen were known to have died; seven were reported as having partially recovered or as being scrofulous; in twelve the final results were not given; only five were stated to have recovered. The youngest fatal case was the one just reported. The usual cause of death had been general tuberculosis. In many of the reports several children had been infected by the same operator. In nearly all of the reports the fact was stated that the families were free from tuberculosis. As a rule the symptoms and progress of the infection was similar to the case reported. In a very considerable number of cases it was reported that the glands broke down and abscesses formed, usually in two or three months from the time of the initial infection. The cases in which early suppuration of the inguinal glands took place and which were operated upon, either by removal or cureting, were among those in which the results were the best. The symptoms of a widespread general infection rarely occurred earlier than the third or fourth month. That the infection spread through the lymphatic system seemed certain and early removal of the inguinal glands would therefore appear to be the most important measure to be employed in checking the spread of the infection. To be successful this of course must be done early.

In a very large proportion of the cases the first diagnosis made was syphilis and much valuable time was lost in antisyphilitic treatment. Dr. Holt said that it was his belief that syphilis was much less frequently acquired in this way than was tuberculosis and that the latter disease should be first suspected. With the modern means of diagnosis at their disposal the early recognition of tuberculosis ought not to be difficult. While the reports of the number of cases acquired through circumcision were considerable there must be a very much larger number which never found their way into the literature; moreover, it was also certain that syphilis had been acquired in this way. These facts led the writer to emphasize the statement of the late Professor Maas, that "it is the duty of the physician to raise his protest against the performance of ritualistic circumcision in every case."

DISCUSSION.

Dr. William P. Northrup reported the case of a child, one of a series of five. In all of these children was what might be called a delicate constitution. The child he reported had high temperature and a tentative diagnosis of pneumonia was made. Physical signs showed scattered râles—they were in fact quite universal, appearing in all parts of the lungs. There were many dry subcrepitant râles, but with no signs of consolidation.

Dr. Sara Welt-Kakels reported the case of a boy six months old. His parents were perfectly well. There was no syphilis or tuberculosis in the family. On the ninth day after birth the child was ritually circumcised. From that time on, according to the mother, the child never appeared well and suffered from fever and gastric disturbances. The circumcision wound did not heal well. When the child was four weeks old the inguinal glands became enlarged and some ointment was prescribed. At the Mt. Sinai Dispensary Dr. Welt-Kakels saw the child some seven or eight weeks later and she detected fluctuation and aspirated the gland contents, getting a serous fluid mixed with flocculent material. Tubercle bacilli were found in the pus. A few weeks later the glands were removed. The v. Pirquet reaction was positive. The man who circumcised the child ritually was said to suffer from a chronic cough, and had since died. The little boy recovered.

TUBERCULIN SKIN REACTIONS IN INFANCY.

Dr. Alan Brown made this report from the service of L. Emmett Holt at the Babies' Hospital. He said that local reactions have been described as long ago as 1900 by Epstein, Escherich and Schick, but no definite distinction was made between subcutaneous and puncture reactions. In 1907 von Pirquet introduced the cutaneous application. The cutaneous test was by far the best for diagnostic purposes and it was apt to be more reliable than any of the others. The test was specific as the experimental evidence on this point brought out by von Ruck, Mantoux, Lord Lawrason Brown and many others shows. Many of the criticisms of the test have been founded on faulty premises, imperfect technic, and misinterpretations.

Technic.—The simplest method should be used; the elaborate needles and scarifiers, etc., served only to complicate matters and in many cases produce too much local reaction which led one to faulty conclusions. For the past three years the undiluted tuberculin had been used. A small drop was placed on the outer side of the forearm which had been previously washed with alcohol and, after making the control scratch with a sterile needle, fully 2 inches from the tuberculin, a similar scarification was made through the drop, each scratch being less than a quarter of an inch in length. It was best to hold the infant's arm until it was dry. If excessive reaction occurred it was well to cover it with gauze in order to prevent infection.

The reaction consisted of a red areola and slight induration. The reaction occurred in several forms.

1. The ordinary reaction which usually appeared within twelve to eighteen hours, and was at its maximum intensity in twenty-four hours, remained at its height for one or two days and then gradually disappeared inside of three to four days followed by a slight local desquamation.

2. A rapid reaction which might occur within a few hours only to disappear within ten to twelve hours. This might readily be overlooked and was of no diagnostic importance.

3. An intense reaction which appeared about the same time as the first form but might take two or more days to reach its maximum. Rarely vesiculation occurred.

There was more or less induration of the skin. There seemed to be no relation between the intensity of the reaction and the activity of the disease.

The total number of tests tabulated was 650 divided as follows:

One to three months, sixty-two cases. Thirteen had a positive reaction, fourteen had a definite history of contact with a tuberculous individual; all these infants died and the diagnosis was confirmed by autopsy in every case. Of the fifty-nine negative cases autopsies were performed in ten, in none of which was a tuberculous focus found.

Three to six months, 102 cases. Seven responded to the test; six of the infants died and diagnosis was confirmed by autopsy or by the finding the bacilli in the sputum or cerebrospinal fluid. or by remaining case was in a child suffering from marasmus, who was discharged unimproved. Of the ninety-five cases giving a negative response, thirteen came to autopsy, in none was a tuberculous focus found.

Six to twelve months, 217 cases. In forty-three cases a positive reaction was obtained, thirty-five or 81 per cent. of which proved to be tuberculous either by autopsy or bacilli findings. Five died before the result of the test could be determined. Of the remaining three positive cases two had pneumonia and were discharged cured, while the third had adenitis. In the 174 giving a negative response sixteen autopsies were performed. In only one case was a miliary infection disclosed. This is the solitary instance of the entire series of a want of correspondence between the results of the test and autopsy findings.

Twelve to eighteen months, 156 cases. Of these, thirty-seven gave a positive reaction, twenty were proved either by autopsy or bacilli findings to be tuberculous. Ten of the remaining cases were cases of clinical tuberculosis; discharged unimproved. Three were improved and three cured. Of the 119 giving a negative response to the test there were fifteen autopsies performed and in none was a tuberculous focus observed.

Eighteen months to two years, 112 cases. Twenty-four gave a positive reaction and of these fifteen or 62 per cent. were proved tuberculous by autopsy or bacilli findings. Of the remaining nine cases, four were moribund on admission and died within twenty-four hours. All were proved tuberculous by autopsy. Not one of the latter cases responded to the test. Four others were cases of active tuberculosis and were discharged unimproved. One case was cured with no evidence of tuberculosis. Out of the eighty-eight cases giving a negative response four came to autopsy; nine showed evidence of tuberculosis.

Conclusions.—1. In view of the fact that 70 per cent. of positive cutaneous reactions in hospital infants under two years of age (which do not include moribund cases or cases with active tuberculosis that were discharged) have definitely been proved fatal, one would seem justified in stating that at least 90 per cent. of positive cutaneous reactions in hospital infants which were under two years, and especially so in infants under one year, means active and fatal tuberculosis and furthermore that the lesions are, with but rare exceptions, general in distribution.

2. In suspicious cases a second and even third test should be made if the first proves negative.

3. The infant shows a high degree of susceptibility to tuberculosis as is shown by the fact that of sixty-one cases of definite exposure

forty-one or 67 per cent. responded to the test and of these, thirty-seven or 60 per cent. of those exposed, died of tuberculosis.

4. A negative cutaneous reaction in infancy except in moribund cases or those suffering from measles is almost conclusive evidence against the existence of a tuberculous focus.

TRANSACTIONS OF THE AMERICAN PEDIATRIC SOCIETY.

Meeting of May, 5, 6, and 7, 1913.

The President, JOHN LOVETT MORSE, M.D., *in the Chair.*

(*Continued.*)

NEEDLE IN THE LEFT VENTRICLE OF THE HEART (X-RAY).

DR. WILLIAM P. NORTHRUP of New York.—The subject of his paper was a puny, undersized, pale, female child who was brought to the Dispensary of Bellevue Hospital hoping that she might be strengthened, her color improved and her bronchitis cured. She was sent up for demonstration purposes as a case of congenital heart disease. There was a purring thrill and the writer thought it one of the exceptional cases in which cyanosis did not appear. The loud purring murmur was heard all over the front of the chest and was not of maximum intensity over the left second space and costal sternal junction. It was heard everywhere but rather loud over the belly of the left ventricle. The child was taken into the hospital and an *x*-ray taken which seemed to show a needle. The operator thought there was some mistake and made several *x*-rays all of which confirmed the presence of this foreign body. While the surgeons were debating as to how to get the needle the child developed bronchitis from which she recovered. There was no hope from an operation and no hope that she would live without one. She was sent into the country for a short sojourn but returned before long with a pneumonia and died within twenty-four hours. The needle was found free in the left ventricle, butt end downward. The point stuck up, between the cusps of the mitral valve. The point free in the auricle had scratched the endocardium freely but only in a small area. The needle was slightly corroded but there was not much antemortem clot about it. The apex of the heart was adherent to the pericardium over an area the size of a quarter of a dollar; there was also a slight roughening of the pericardial surface about the adhesions. On the under side of the pericardium was a line streak of rust showing the course by which the needle had travelled from the abdominal cavity to the ventricle. The needle had entered the abdomen by way of the skin presumably at the time of a fall from the cradle a year previously. At that time the mother noticed a protrusion just below the ensiform cartilage as though the child had swallowed something. The doctor told her that it would disappear and from that time the child had had pains in the stomach.

DEMONSTRATION OF MODIFIED MACKENZIE'S INK POLYGRAPH.

DR. WALTER LESTER CARR of New York said that records obtained by sphygmographic tractings were liable to many variations particularly in children. These variations were dependent upon the instrument, the movement of the arm at the time of making the sphymogram and the personal equation incident to the operator. Not all of these factors could be eliminated entirely, but by enlarging the roll and changing the surface of the paper the excursion of the pen recorded more accurately and lessened the errors. The smoked paper was replaced in this apparatus by a smooth paper that took ink readily and the recording pens were made larger than the capillary tubes recommended by Mackenzie. The error due to the movement of the arm was lessened by making use of the carrying box of the polygraph for a rest. The personal equation of the operator could be overcome only by experience and by making polygrams under the same or as nearly as possible the same conditions. The modified Mackenzie polygraph shown had the advantages over the original instrument of Mackenzie in the width of the papre, the three tambours, and the recording pens. With three tambours the radial, cardiac and carotid pulsations might be recorded simultaneously and comparisons made in the cardiac and vascular tracings. Like all instruments it was not exact but it lead to exactness and should be used to further accuracy in the study of cardiac and vascular disease.

THREE TYPES OF OCCLUSION OF THE ESOPHAGUS IN EARLY LIFE.

DR. THOMAS MORGAN ROTCH of Boston said that considering the rarity of this condition it was rather a coincidence that three cases of esophageal narrowing should have entered the same wards. The first case was that of a boy twenty-five months of age who had been breast fed until seventeen months of age. From the time of birth he had always vomited four to six times daily. This vomiting occurred during feeding and was never forcible. Sometimes it occurred just as he began feeding. The vomitus was not curdled or sour and had no regular relation to the feeding. He vomited less when only 3 ounces were given at a feeding. He had always been constipated. Physical examination showed the heart dislocated to the right and having a blowing systolic murmur, loudest at the base, and transmitted to the left axilla. There was no systolic retraction. The urine was normal. The stethoscope revealed a slight splashing sound from fifteen to twenty seconds after a mouth full of milk was swallowed. An *x*-ray picture taken after a bismuth meal showed narrowing of the lower third of the esophagus. The stricture of the esophagus was approached by a funnel-shaped narrowing while the upper part of the esophagus was slightly dilated. The child lost rapidly in weight. The stricture was so small that it was deemed dangerous to attempt to dilate. Gastrectomy offered the only hope of relief. An operation was performed and the child died. No autopsy was permitted. This was an extreme ase of congenital organic condition of the type which was inoperable and almost universally fatal.

The second case was of a type more favorable for treatment. It represented a type of probable congenital narrowing not necessarily of organic lesion in the esophagus but caused by congenital central spasm resulting in dilatation of the esophagus above the point of narrowing. The patient was a girl ten years of age giving a history of vomiting and distress. Physical examination revealed nothing abnormal, but the *x*-ray showed that bismuth passed a little way beyond the middle of the esophagus and there was none in the stomach. The esophagoscope was passed and encountered orange pulp in which was entangled a penny. There was marked dilatation of the lower third of the esophagus.

The third case was that of a boy, five years of age. As long as he was fed on liquids and soft solids he did not vomit everything he ate. Physical examination revealed nothing abnormal. The bismuth meal and *x*-ray pictures taken at intervals showed nothing in the chest and the bismuth passed into the stomach and intestine, showing that there was no pyloric stenosis. The stomach tube met with resistance at a distance of 24 c.c. from the incisors. The resistance gave way, and the tube passed into the stomach. The stricture was near the cardiac end of the stomach. Dilatation was performed every four hours. Later a bismuth meal was administered without the tube and the picture showed the bismuth passing through the stomach. The tube was passed once daily for two weeks after which time food was taken without vomiting. There was later a relapse in this case. It seemed that there were two classes of these cases, both congenital, one dependent on a localized organic condition and the other functional.

DISCUSSION.

Dr. J. Crozier Griffith of Philadelphia said that these cases of trouble in the esophagus of congenital nature were rare and interesting. In a case like the first one cited operative treatment offered no hope as the esophagus was reduced to a cord and there was a tendency to have the body of the esophagus open into the trachea and in consequence the child choked when an attempt was made to swallow.

THE FUTURE STUDY OF THE ANATOMY AND PHYSIOLOGY OF THE INFANT STOMACH BASED ON SERIAL RONTGENOGRAMS.

Dr. Godfrey R. Pisek and Dr. L. T. LeWald.—In their study they had tried to determine the normal size and shape of the infant's stomach, its relation to the neighboring organs, the influence of the internal organs on the viscus, its behavior under different amounts of food, the influence of different types of food as liquid or solid, acid or alkaline, its peristaltic action, motility, the passage of food through the gastrointestinal canal and the application of this knowledge to certain pathological conditions. The text-book descriptions of the size and shape of the infant's stomach did not correspond to the results of their findings. They were forced to conclude that there was no definite normal type of stomach in the infant. It was horizontal rather than vertical in position when compared with the adult types, and followed certain rather definite forms. It was distinguished by the ovoid shape, the tobacco pouch, or the pear-shaped stomach with its base above and to the left. Its shape did not depend directly upon the amount or character of the food ingested, but rather upon the quantity of gas which it contained or acquired. Its limits were greater than they were accustomed to believe, extending to the liver on the right side and at times filling the entire transverse space from one abdominal wall to the other. Of particular interest from the standpoint of diagnosis was the position of the pylorus. In the majority of cases this was found comparatively high and behind the pyloric third; at times its position could not be determined even though they clearly saw that the food had passed out of the viscus. Alwens and Husler reported that they had observed a change in form from tobacco pouch to the bagpipe variety after the intestines had been emptied. This finding also occurred in their series.

The question of contained gas was interesting. In some cases the gas acted as a buffer, preventing the overdistention of the stomach with food. As a rule the broader and more protuberant the abdomen of the infant, the greater the amount of gas the stomach contained. In a number of cases bismuth was seen in the duodenum one minute after the food had been introduced into the stomach by gavage, the average time being five minutes. After the greater part had passed through the emptying action became slower. Except in instances where semi-solid food or cream were fed the viscus tended to empty itself with unsuspected rapidity. They also questioned in this connection the advice of those who recommended placing infants on four-hour feeding intervals, since a large number of stomachs emptied themselves in an hour. In abnormal cases as chronic disturbances of nutrition the stomach began to empty itself very rapidly and the emptying time was even shorter. In one series of röentgenograms the retarding action of alkalies was shown. Their observations tended to confirm those of Grutzer and Sick that foods in the stomach did not tend to intermix. Sick went still further and said that with fluid food they had the formation of true layers, so that in milk digestion they had the whey expelled first, later the casein and last the fat content. The normal stomach tended to expell its gas soon after the entry of food; it tended to envelop and surround the food, and to diminish in size. A peristaltic wave passing along the greater curvature was caught on the plate at times. In conclusion Dr. Pisek said that the field of research in this direction had merely been opened. There were many observations particularly dealing with food in the intestines which needed close study, particularly in connection with the disturbance of bowel function so frequent in early life.

DISCUSSION.

Dr. Maynard Ladd of Boston wished to congratulate Dr. Pisek on the excellence of his plates, that no one could appreciate more than he the difficulties encountered in getting pictures of infants. In order to get them quickly one had to use the intensifying screen and it was difficult to exactly time the exposure. The amount of work involved was very great but the röntgenogram gave a great deal of information in regard to the gastric condition. In his work he had had the child lie on the back or stomach; he had found that the position of the stomach was different according to whether the child was in the horizontal or the upright position. He had not supposed that it made any difference as to the position in which the child was placed. The stomach might be emptied to a considerable extent in one and one-half or two hours, but in order to completely empty it the time varied up to four, four and one-half, or even five hours if the child was not subjected to a new feeding which gave rise to a tendency to contract. There was a great lack of peristalsis observed in the stomachs of infants and young children; the rhythmical peristaltic waves of the adult were wanting.

Dr. Henry Dwight Chapin of New York had recently studied two babies that were given the barium meal. Radiographs were taken at regular intervals and it was found that the barium reached the rectum in eight hours. The ingested meal began to leave the stomach almost immediately but it was several hours before the stomach was completely emptied. In studying the bowel it was found that the barium went through and reached the cecum in a few minutes and in one case it even went through the ileocecal valve. Röntgenography had opened a great future for the enlargement of their knowledge of the intestinal tract both in respect to its anatomy and to its physiological functions.

Dr. Fritz B. Talbot of Boston asked what became of the volume of gas in the stomach as this had to be accounted for when food was ingested. He also asked if these babies had cried from handling when they were being prepared for exposure. He had been told that crying and coughing made some difference as to the time in which the stomach emptied itself.

Dr. David Murray Cowie of Ann Arbor, Mich., asked in what position the patients were just before the pictures were taken. He said that he had a different group of pictures from that of Dr. Pisek. In his own pictures one could usually see the duodenal cap and one could not see it in Dr. Pisek's pictures and this brought up a point of diagnosis; the patient would not show duodenal obstruction as when in the prone position.

Dr. Henry Heiman wished to call attention to the fact that the capacity of different infants, stomachs varied materially, all the way from thirty to one hundred and eighty grams. Dr. Pisek had shown this perfectly.

DISCUSSION.

Dr. Pisek, in closing the discussion, said that in reference to Dr. Talbot's question as to what happened to the gas when food was ingested, the gas had a tendency either to be expelled upward or to be forced downward ahead of the food as the stomach contracted on the food. Frequently when a child seemed to be through nursing if it expelled gas it would nurse more and so the gas had a good deal to do with the amount of food taken. This suggested that in cases where there was much gas a concentrated food was indicated. It seemed to him that the verdical position gave better röntgenological results than the horizontal. The children were kept in the horizontal position and as quiet as possible before the pictures were taken, but they had no record of which babies were quiet and which were crying. This omission was to be regretted. The weight of the bismuth was not a factor. One could use a colloid of bismuth. Alkalies had the effect of delaying the emptying time of the stomach. He had pointed out the tendency of the stomach to empty itself rapidly and the average emptying time might be said to be three hours. Sometimes there was a deposit of bismuth left and he had tried to withdraw this but it would just get into the tube and he could not withdraw it, so he had added water and recovered it and found that the quantity was very small.

WHY DOES THE OPERATION FOR THE REMOVAL OF ADENOIDS FREQUENTLY FAIL TO RELIEVE MOUTH BREATHING?

Dr. H. M. McClanahan of Omaha, Neb.—The lay public had been taught that mouth breathing in children meant the presence of adenoids, nothing more, and that certain relief would follow an operation for their ablation. This opinion prevailed largely among members of the medical profession, and until beginning this study that was the belief of the writer. For many years he had noticed that the degree of relief from mouth breathing following adenoidenectomy varied greatly in many cases; in some it was very slight, in others prompt and decided.

On August 1, 1909, he operated upon a boy eight years of age for adenoids. There was slight, if any, relief from the mouth breathing. The operation was a failure but not due to any fault of his. He then began a study of the effect of operation in children coming under his observation. When he had ascertained that a child had been operated on for adenoids, he made a study of the case, taking into account the following facts: (1) The facial expression; (2) the ability of the child to breath through the nose with the mouth closed; (3) the appearance of the mouth and throat; (4) the condition and coaptation of the teeth. In studying the facial expression he was careful to watch the child when it was unconscious of being observed, to note the general contour of the face, the outline of the nose, the size of the anterior nares, the relation of the lips to each other, and the relation of the upper lip to the teeth and the length. The following were his conclusions: (1) A careful examination of the case before operation would determine with a reasonable certainty the degree or relief that would follow the removal of adenoids. (2) Where there was a deformity in the superior maxilla, a frank statement of the facts would relieve the operator from unjust criticism. (3) Where anatomic defects existed, the parents should be apprised of the facts and given the opportunities to have corrective treatment instituted by the orthodontist. (4) The best evidence of such defect was malcoaptation of the teeth.

DISCUSSION.

Dr. Henry Heiman said that they had all had similar cases and it was a good thing to send them for orthodontic treatment; it usually required from one to two years to have the condition corrected.

Dr. Chapin said that in recent years he had been noting the high Gothic arch and where this was present an operation did not offer much relief so far as breathing was concerned. There were many cases which should not be operated upon.

Dr. Carr said that it was unfortunate if the child fell into the hands of the orthodontist first. Sometimes the child was taken to the dentist, the rhinologist and the laryngolist one after the other without much relief. One thing was often overlooked and that was that there was a widening of the throat at the base of the skull with the growth of the sphenoid bone and in the course of developmental changes also of the maxillary bone and some correction would come with the growth of the child. So when dealing with the high Gothic arch and adenoids one should remember that there would be a physiological development.

Dr. Holt called attention to one cause for the lack of success after operations in some of these cases and that was the narrowing of the posterior pharynx by the prominence of the vertebral bodies.

Dr. McClanahan had emphasized the point during the past six years that where there was lack of coaptation of the teeth it was advisable to tell the parents or those having the care of the child that there were other abnormal conditions present beside adenoids and that it was possible that operation would result in failure. This course would frequently save the physician from censure.

A CASE OF HYDROPHOBIA.

Dr. Alfred Hand of Philadelphia reported a case of hydrophobia occurring in a young boy in which a diagnosis was made before many of the typical symptoms appeared because of the inability of the patient to swallow water and the extreme distress that the attempt to drink occasioned. The subsequent development of the case and the autopsy showed that the early diagnosis was correct.

DISCUSSION.

Dr. Matthias Nicoll, Jr., of New York said that two years ago he met with the case of a boy twelve years of age, who had been bitten by a dog three weeks previously and had taken one treatment. The boy did not seem to have anything particular the matter with him, but Dr. Poor saw him and said the boy had rabies. He had pain in his arm and the upper part of his shoulder. He wanted to test the boy with water, but Dr. Poor said that was not advisable as it would frighten the boy. Finally he was given a swallow of water, when he grabbed his throat and gave a shriek. The boy said he had sat by an open window in a car and became slightly chilled and the same thing had happened. He died later, but the way in which Dr. Poor had made the diagnosis had impressed him.

PAROTITIS COMPLICATED WITH MENINGITIS.

Dr. George N. Acker of Washington, D. C.—Nervous troubles in the course of parotitis had not escaped the attention of older observers. Some writers had observed meningitis often in cases which had orchitis and were led to believe that such cases were more severe, yet in children in whom orchitis rarely occurred meningitis had been noted in a number of cases. Acute meningitis was usually described under three periods, namely, invasion, excitement, and depression. Such a description could not be given in the meningitis complicating mumps. The symptoms usually took a variable course even when all of the symptoms were present. Nervous complications were tolerably frequent due to the involvement of both cerebral and peripheral nerves. A meningeal reaction might present itself in connection with attacks of mumps coming on on the second or third day after the swelling of the parotids, although it sometimes supervened later. The meningitis manifested itself by a rise in the temperature, headache, insomnia, and general discomfort. As a rule the pulse did not increase in rapidity in proportion to the rise in temperature. In exceptional cases the symptoms were more severe, showing all the signs of typical meningitis. Lesions of the nerves were sometimes consequent to meningitis or occurred independent of it. Various authorities had endeavored to explain the nervous complications of mumps. In 1902 A. Monad practised systematically lumbar puncture in infants attacked by parotitis and proved six out of eight times a lymphocytosis of the cerebrospinal fluid as abundant as that in tuberculous meningitis. Dr. Acker demonstrated that this disease was capable of determining an appreciable change in the meninges. The same thing had been confirmed by Sicard, Chauffard, and Borden in 1904 and a number of investigators since that time. All found a lymphocytosis in parotitis that showed many nervous symptoms. The fluid was clear with numerous lymphocytes, the same as in tuberculous meningitis. There was a small amount of albumin but no fibrin. In the latter disease the meninges were permeable to iodine but not in the first. Lumbar puncture was useful not only in diagnosis but also as a therapeutic measure, as the severe symptoms yielded soon after its employment. The lymphocytosis lasted only a short time. That the diplococcus was the pathogenic agent in causing parotitis there could be but little doubt. This organism had been isolated from the saliva and blood, but according to Depter the bacteriological examination of the cerebrospinal fluid and meningeal exudate collected after death was sterile. The quick onset would differentiate this form of meningitis from tuberculous meningitis which came on slowly. It could be differentiated from cerebrospinal meningitis by the clear fluid and the absence of the meningococcus. The meningitis generally disappeared rapidly. The motor paralysis could last a long time but finally disappeared. The deafness and atrophy appeared to persist. It might be followed by the development of very alarming symptoms and by permanent damage to important organs or even end fatally.

Among the sequelæ of the disease might be mentioned peripheral neuritis and paralysis of the extremities lasting for months. The meningitis mumps, while not a common complication yet occurred often enough to make one employ careful measures during the first two weeks of the disease. Mumps was an infection specific and general in its nature localizing in the salivary glands but affecting all the economy the same as the eruptive fevers.

Dr. Acker reported in detail two cases of mumps complicated with meningitis and reviewed the cases reported in the literature.

A CONTRIBUTION TO OUR KNOWLEDGE OF THE EXCRETION OF PHOSPHATES IN INFANCY.

Dr. J. H. Mason Knox, Jr., and Martha Tracy of Baltimore.— A number of early investigators had observed that the excretion of phosphates in the urine of young infants was very low, but such observations were made on single specimens of urine only, and were therefore of no great value. Keller had observed that the excretion of phosphates in the urine of young, normal, breast-fed infants was very low or nil, gradually increasing with the age of the child, as did the nitrogen excretion. He noticed that a normal infant fed on cow's milk excreted considerably more phosphorus in the urine than did the breast-fed infant, the increase of phosphorus excretion being greater than could be accounted for by the greater phosphorus content of the ingested food. Keller believed that inorganic phosphorus was related to the kind and amount of food, but that the organic phosphorus of the urine was not so related. Moll from his observations drew the conclusions, that when a breast-fed child was contented, and gained steadily in weight, showed no appearance of illness, and excreted no phosphorus, or merely traces, it was well; when an infant lost in weight, and in the urine excreted no phosphorus, or mere traces it was hungry; when an infant lost weight, or failed to gain, and, with apparently sufficient nourishment, excreted considerable phosphorus in the urine, it was sick. Moll believed that careful observations on the phosphorus excretion served as a useful check on dietetic procedures, and that a continued low excretion of phosphorus on increasing diet signified that conditions were satisfactory, while an increased phosphorus excretion was a sign that digestive or nutritional disturbance was present. Wolff concluded that the phosphorus of the urine was derived from proteins, the source of the urinary nitrogen, and was therefore parallel to the nitrogen excretion. It was thus of different source and significance from the fecal phosphorus wihch was derived from food phosphate, from the bones, and from intestinal secretions.

The series of observations here reported, from the Thomas Wilson Sanitarium for Children was of interest in that it added considerably to the published data on this subject. Their object in making this study was to determine whether Moll's observations in regard to the clinical significance of phosphorus excretion in the urine of breast-fed infants, would hold good for artificially fed children. Preliminary experiments with collection of feces as well as urine at once made clear the fact that in their children suffering from more or less severe intestinal disturbances, the varying admixture of blood, mucus and pus with the fecal material, would make the study of the stools, from the point of view of phosphorus excretion of comparatively little value. They therefore confined themselves to the study of the nitrogen and phosphorus excretion of the urine, in correlation with the phosphorus and nitrogen in the diet. For phosphorus determination the uranium titration method was used throughout the urianalyses. The author presented a table showing the intimate bearing of the diet on the phosphorus excretion. In the cases in which the phosphorus and nitrogen of the urine were not parallel an unusual dietetic reason was apparent. Their experience with many of their cases had impressed upon them the value of at least one twenty-four hour metabolism bed observation on every child admitted to the hospital. Only in this way could accurate knowledge of the kidney function be obtained. They were confident that in a number of instances a toxic condition was properly related to the kidney insufficiency, rather than to the intestinal condition, only by the metabolism bed procedure. Such a routine practice, in a large babies' hospital demanded a large staff of competent nursemaids, but the accurate diagnosis thus obtained warranted the care involved.

EXPERIMENTAL SCORBUTUS AND THE X-RAY DIAGNOSIS OF SCORBUTUS.

DRS. FRITZ B. TALBOT, WALTER DODD, CHANDLER FOOTE, and HUGO O. PETERSON, of Boston.—Holst, von Fürst and Frölich, Scandanavian investigators, have done innumerable experiments on guinea-pigs in an effort to determine the cause of scorbutus. They were able to produce typical macroscopic and microscopic lesions which corresponded with scurvy and scorbutus in the human being. Their work has been criticized, and other writers have said that these changes were due to inanition. They answered this criticism by causing inanition in guinea-pigs without causing scurvy. Clinically the guinea-pigs' teeth became loose, the gums swollen and reddened, and they eventually had hemorrhages around the bones and in the muscles. They died in from four to seven weeks after the diet was instituted. The writers repeated this work in order to obtain by the röntgenogram the white line which was found in infantile scorbutus and which the writers considered diagnostic of scurvy. This white line was first described by Fränkel. It consisted of a white line which ran transversely across the lower end of the long bones. The line might be either straight or crooked. Pathologically it corresponded to the line obtained by the x-ray and appeared under the microscope as an area of increased density. The line could not be obtained when there was complete union of the epiphysis and diaphysis. For this reason it was obtained in only one or two of the younger guinea-pigs. The very young guinea-pigs that weighed under 300 grams died before there was any evidence of scurvy. The writers also repeated the work of Hart in monkeys and obtained changes which were pathologically very suggestive of scurvy. They also obtained a definite and typical white line at the diaphyseal junction.

When scurvy is complicated by rachitis the end of the diaphysis was ragged and had a teased-out appearance just as if it had been teased with a needle. There is also enlargement of the ends of the bone. This condition was typical of rickets and represented a condition which had no connection with scurvy. The white line was typical of scurvy but has no connection with rickets. The white line was probably the most important and earliest means of diagnosing scurvy.

THERAPEUTIC MEASURES IN CARDIAC CASES.

Dr. W. P. Lucas of Boston.—Many of the therapeutic measures employed in the treatment of heart disease had been handed down or accepted simply from pharmacological experimentation which was not always an accurate estimate of the clinical value of any therapeutical procedure or of any drug. Digitalis had been tested both experimentally and clinically so there could be little doubt as to its value. Strychnine therapy showed conflicting evidence from the side of the pharmacologist and from that of the clinician. From the standpoint of the pharmacologist the effect of strychnine was on the sensory centers, not on the motor. Strychnine in small doses increased reflex excitability of the spinal cord, so increasing the muscle tone which brought about secondary results, such as increased metabolism, a tendency to rise in blood pressure, an increase in pulse rate, and an increase in temperature. Strychnine caused a stimulation followed by depression of the medullary centers. Its effect on circulation in small therapeutic doses was by direct action on the vasomotor and vagus centers. The action on the heart was at first a stimulation, but this was only seen when the heart was directly perfused with a strong solution and could not be considered as a cardiac stimulation in any therapeutic manner. Indirectly strychnine might improve the circulation by improving the respiration or by altering the distribution of the blood without affecting the general blood pressure. In large doses it produced a marked effect on circulation and a marked rise in blood pressure, due to central vasomotor stimulation aided by convulsions and asphyxia. Its effect on the centers of respiration was important. It removed the depression of the respiratory center. From clinical studies they had very diversified findings as regarded adults, but thus far the only observations on children were those of Cook previously related. He stated that the blood pressure during the first few months of life was from 70 to 75 mm. of mercury, from six to twelve months, from 80 to 85; that below 60 was rare during the first year except in cases where there was marked need for stimulation. During the second year the blood pressure ranged from 80 to 90 mm. of mercury; during the third year from 90 to 100; and from three to ten years 85 mm. of mercury was moderately low; 75 was low, and 65 very low. Crying and restlessness raised the blood pressure from 5 to 10 mm. The highest pressure occurred between 4 and 7 o'clock P. M. and the lowest probably between 3 and 7 A. M. The writer said that his experiments agreed with this. In his series of infants there were no cardiac cases. His charts showed that strychnine was usually used in conjunction with digitalis or was followed very closely by digitalis. In another chart it was seen that in one case there was a fall in the blood pressure after strychnine, the rise occurring after digitalis; while in another case there was a rise of 10 mm. after small doses of strychnine and the child was not a cardiac case. He had watched the effect of strychnine in nine cases during the past few months (all of these cases were the result of endocarditis occurring in the course of rheumatic fever). The children were given little or no medication the first few days after admission to the hospital and sometimes for longer periods in order to observe the effects of rest. They were then given some one cardiac stimulant for a definite period, sometimes digitalis and sometimes strychnine. All the effects were carefully noted and he found that strychnine was practically of no effect when given in the ordinary doses which were prescribed for children. It was only when doses mounting to 1/10 grain or more were given (either in one dose or in a quick succession of smaller doses) that any appreciable effect was noted and then the effects appeared within thirty minutes and disappeared within two hours. In four cases he had studied the effect of caffein sodium benzoate as a stimulant. In ordinary doses of 1/4 to 1/2 grain hypodermatically or by the mouth it produced no apparent effect; only in doses of two or more grains given hypodermatically was there an appreciable effect, and then the effect was slight and of short duration. Dr. Lucas concluded that strychnine and caffein in the doses usually used for cardiac stimulation were of no value. It was only when maximum doses were used that they got any effect and the effect was usually of short duration. Whether this was a beneficial effect was even questionable in children with cardiac involvement. It might be, as D. Sollman had suggested that strychnine stimulation made the heart work harder, that it should not be used as a cardiac stimulant. Its effect on respiration in conventional doses was of no value; in large doses it did not appear to show respiration to a point where there were toxic symptoms of increased hypersensitiveness of the reflex arc or where the heart action became more rapid and the blood pressure fell.

CARDIAC DISEASES IN CHILDHOOD WITH SPECIAL REFERENCE TO DIAGNOSIS.

DR. CHARLES HUNTER DUNN of Boston.—1. Rheumatic fever is very much the commonest cause of cardiac disease in childhood.

2. Cases seen with acute rheumatic infection localized in the heart are much commoner than cases suffering from chronic endocarditis.

3. Cardiac symptoms are due to two causes; first, acute infection localized in the heart; second, broken cardiac compensation. Of these two causes the first is the commoner.

4. The liability of children to recurrent attacks of acute rheumatic infection, in any of which the heart may be involved, is very great.

5. The immediate mortality of rheumatic cardiac disease is about 20 per cent.

6. The subsequent mortality of patients with endocarditis of rheumatic origin, followed for at least ten years is about 50 per cent.

7. The final mortality of rheumatic fever followed for at least ten years is 60 per cent.

8. The mortality is seen chiefly during childhood. The mortality after young adult life is reached falls to only 7 per cent.

9. The cause of death is heart failure. The cause of the heart failure may be either acute cardiac infection or broken compensation. In childhood the former cause is far the more common. After adult life is reached the latter cause is more common.

10. The particular valvular lesion present has little or no relation either to the mortality or the amount of disability in adult life; except, aortic disease appears to be a particularly fatal lesion in childhood.

11. The causes of the great mortality of rheumatic fever in children are, first, their greater liability to this infection; second, their greater liability to recurrent attacks; third their greater liability to cardiac involvement.

12. Patients who escape the dangers of childhood, and who enter adult life, are apt to show a remarkable freedom from disability. The majority of such patients can lead normal active lives.

13. The probable cause of this freedom from disability lies in the fact that cardiac damage occurs during the period of growth, and that during this period a particularly perfect adaptation can take place between the heart and the patient, which enables the heart to meet the demands made upon it. This adaptation is more perfect than can be attained in adults.

14. The earlier in life the cardiac lesion is acquired, the better is apt to be the result in adult life, as concerns ability to lead an active, normal existence; provided that the patient escapes the dangers of childhood.

15. Treatment should be directed at favoring the adaptation of child and heart. While guarding against overstrain, we must avoid too great limiting of the normal activities of childhood.

16. In congenital cardiac disease, open ductus arteriosus is a favorable lesion.

STUDIES ON THE INCUBATION PERIOD OF SERUM SICKNESS.

DR. DAVID MURRAY COWIE of Ann Arbor, Mich.—As a result of this study the following conclusions might be drawn:

1. The clinical incubation period of serum sickness was chaacrterized by two stages, a preallergic and an allergic stage.
2. The same biochemic phenomena occur in all individuals injected with horse serum whether or not cutaneous symptoms are seen.
3. A small dose of horse serum sensitizes an individual to a subsequent injection, as determined by the intradermal test, but a large initial dose causes a greater sensitization up to a certain point beyond which sensitization apparently may not be increased.
4. An individual who has once passed the preallergic stage almost invariably reacts promptly to a second injection of horse serum as shown by the intradermal test.
5. Horse serum particles float in the blood stream unchanged for many days, at least its *allergen* portion.

ELECTION OF OFFICERS.

The following officers were elected for the year 1913-1914: *President*, DR. SAMUEL MCC. HAMILL of Philadelphia; *Vice-president*, DR. MATTHIAS NICOLL of New York; *Secretary*, DR. SAMUEL S. ADAMS of Washington, D. C.; *Treasurer*, DR. C. H. DUNN of Boston; *Editor and Recorder*, DR. LINNAEUS E. LAFETRA of New York.

The place of meeting in 1914 will be New London, Conn.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Abdominal Pain in Infants.—E. Pritchard (*Lancet*, April 19, 1913) says that an infant cries for other reasons than because it is in pain. Crying is a protective reflex. A baby cries in the first instance because by so doing it benefits itself—for example, by expanding the lungs, attracting attention, or obtaining oxygen. The cry, however, may soon become a habit, and may continue long after it has ceased to confer any advantage. It is most important to be able to differentiate between the cry which is really due to pain and the cry which is due to habit, or which is the emotional concomitant of a compound reflex. If we can exclude habit, general nervous excitability, dentition, ear trouble, and obvious external causes of irritation, such as pins, wet napkins, and creases in the clothing, as causes of crying, we shall be justified in suspecting that the source of the pain is localized in the abdomen, by far the commonest seat of pain in infants under six months of age. In quite young infants there is little to distinguish the pain due to abdominal disturbance from pain due to other causes. In this, as in other painful conditions, the legs will be drawn up, the arms flexed, and the hands probably clenched; the recti abdominales will be tense and the abdomen hard. There may be areas of hyperesthesia, but they are difficult to locate, as the infant may be more or less tender all over. With abdominal pain, however, the baby usually appears to be comforted by gently rubbing the abdomen or when laid face downward on a pillow. Heat applied to the abdomen usually gives relief. The causes of abdominal pain in their approximate order of frequency are as follows: 1. Dysperistalsis of the intestines, including enterospasm caused by irritation, obstruction, or nervous incoördination. 2. Disturbances of the motor functions of the stomach, including pyloric spasm, hour-glass contraction, spasm of the cardiac sphincter from wind, food, or other causes. 3. Incoördination of the motor functions of the bladder, spasm of the sphincter vesicæ, etc. 4. Referred pain from the thoracic cavity, pneumonia, pleurisy, empyema, etc. 5. Renal colic. 6. Spinal caries and osteomyelitis. 7. Peritonitis, appendicitis, etc. Dysperistalsis, or incoördinated contraction of the bowel musculature, is by far the most common cause of abdominal pain in infants. Nature has provided in meconium a highly suitable material on which the bowel may practise its tyro efforts. In order that the musculature of the bowel may be excited to contract and perform its functions of peristalsis it is necessary that an adequate stimulus should be applied, neither too strong nor too weak, and this is of special importance during the first two or three days of life when habits are formed. Meconium supplies exactly the right sort of stimulus. It lubricates the mucous membrane and is sufficiently solid to form a very satisfactory motion, until such time as it is replaced by the ordinary constituents of an infant's stool. It is a very frequent practice to sweep this valuable educational medium out of the bowel by a generous dose of castor oil. There can be no more irrational procedure. The castor oil is too strong a stimulus; it excites active peristalsis, and it deprives the bowel of the didactic material which should last it for several days. The after-effects of this initial over-stimulation are reactionary fatigue and constipation, so that perhaps more doses of the purgative are administered before the incoming milk can supply the basis of a natural stool. In this way the natural rhythm and periodicity of the peristaltic function is interfered with from the very first, and the normal function is only subsequently established with much pain and crying on the part of the infant.

Ectopy of the Testicle in the Child.—Savariaud (*Jour. de méd. de Paris*, May 3, 1913) says that in operations for the replacement of an ectopic testicle there is great variation in results as far as esthetic considerations are concerned. The usefulness of the organ after operation is very doubtful. When these organs are not descended they are generally undeveloped, and usually will not functionate if replaced. The question is whether this operation is indicated or not. When this deformity is bilateral there is generally infantilism, with physical and mental debility. Here operation gives poor results. In general the testicle is of small size and accompanied by a hernial sac. The epididymis is more or less separated from the gland, and there is a prolongaton of the vaginal membrane surrounded by red connective tissue fibers. Microscopic examination of these testicles shows little normal tissue. While at puberty the normal tesicle undergoes an entire change in structure, in the ectopic testicle the structure remains infantile. The object in doing this operation is to avoid complications such as pain in connection with injuries in sports, torsion of the testicle, strangulation at the inguinal ring, cancerous degeneration, inflammation propagated to the peritoneum, presence of a hernia difficult to retain. The accompanying hernia is the chief indication for this operation. Degeneration is rare. The organ might be removed if the individual were not a neuropath and were willing. But if he believes that he will become unsexed it is better not to remove the testicle, but to draw it down and replace it in as normal a position as possible for the mental effect on the patient. When the testicle is not high up daily traction on the cord will often cause it to descend with growth. The best age for operation is between the sixth and twelfth years.

Diagnosis of Acute Abdominal Conditions in Children.—E. M. Corner (*Practitioner*, 1913, xc, 798) states that intussusceptions and acute conditions of the appendix are responsible for no less than 91 per cent. of the acute abdominal conditions of children, as seen in surgical practice. Given an acute abdominal condition, if the child is under four years of age, an intussusception is most likely to be the cause; if the child is over four years of age, it is most likely to be due to some form of appendicitis. Of the acute abdominal conditions in children under four years of age, about 18 per cent. of the author's 206 cases were due to inflammation of the appendix. Of the acute abdominal conditions in children over four years of age, only 5 per cent. were due to intussusceptions. The practical point in these cases is to recognize the existence of an acute abdominal condition (surgical), and not, for the patient's sake, to spend much time on differential diagnosis. The most frequent error in the diagnosis of the causation of acute abdominal condition is produced by irregular contractions of the intestine, associated with, and possibly caused by, multiple-enlarged tuberculous lymphatic glands in the mesentery. These glands are present in practically every child's abdomen that is opened. Children usually show great and even exaggerated signs and symptoms—rapid pulse, high temperature, etc. Thus, if anything pathological happens to them, their warnings are generally too obvious to be overlooked. Therefore, with a child there is no great hurry to make a diagnosis, in spite of the importunities of the relatives; it should be seen again in an hour or two, and perhaps again. Then, it is time to act. A rectal examination should never be omitted before deciding against operation. It may be omitted if operation is decided upon; but never when operation is to be decided against.

Speaking from the physician's stand-point, E. Cautley (*Ibid.*, 803) says that there are many acute abdominal conditions which may be mistaken for affections amenable to surgical treatment, such as pleurisy, pneumonia, Henoch's purpura, hemorrhagic colitis, and the onset of coma in diabetes. The main symptoms and physical sgns on which a differential diagnosis can be based are vomiting, abdominal pain, constipation, the condition of the abdomen, the abdominal facies, collapse, toxemia, pulse rate, respiration, and body temperature. These should be considered in relation to the chief diseases, notably appendicitis, intussusception, intestinal obstruction, peritonitis, and simple colic. Special attention is paid to Henoch's purpura, because of the liability to mistake it for intussusception, and because intussusception may occur during its course. Many diseases can rapidly be excluded in the case of children, mainly on account of their rarity, but it is necessary to bear them in mind—*e.g.*, gastric crisis in tabes dorsalis, perforation of simple gastric or intestinal ulcer, acute pancreatitis, cholecystitis and gall-stones, renal colic, embolism or thrombosis of the mesenteric artery, and lead colic. Tuberculous peritonitis may give rise to misleading symptoms of obstruction due to bands or adhesions, the vomiting and constipation being really signs of the onset of meningitis. Adhesions secondary to tuberculous glands, and enlarged glands in the right iliac region, may suggest appendicitis. Moreover, appendicitis may occur and recur in association with neighboring tuberculous glands. In cases of the above type absolute accuracy in diagnosis is not essential, as it is obvious that operation is necessary.

Hair-ball Removed from Stomach of a Child.—An unusual cause of gastric disturbance is illustrated by a case reported by S. Barling (*Proc. Roy. Soc. Med.*, 1913, vi, 171). A girl seven years of age was admitted for vomiting and severe pain in the upper abdomen of two days' duration. Since an attack of dysentery four and a half years before she had been in the habit of chewing up pieces of string, tape, etc., and occasionally fragments of such things had been found in the motion. Her appetite was good up to ten days before the time she was taken ill, food being taken in normal quantity and without discomfort. On examination, a hard lump exactly resembling the outline of the stomach could be felt descending from beneath the left costal arch, and passing transversely across the epigastrium. The outline of the tumor together with the history led to a correct diagnosis. The specimen was easily removed through a longitudinal incision into the anterior wall of the stomach about 3 in. long. The opening in the stomach was closed by a double layer of sutures, and the child made an uneventful recovery. The specimen consisted of a felted mass of hair and string, the former predominating; it presented an exact cast of the stomach.

Anti-Pertussis Serum of Klimenko and its Use.—Geo. Rosenthal (*Jour. de méd. de Paris*, May 3, 1913) says that although it is some time since the germ of pertussis was discovered by Bordet and Gengou, it is not widely known. The germ is a minute ovoid, which is not easily cultivated. It agglutinates the serum of children cured of whooping-cough inconstantly. By inoculation into the nostrils of monkeys there has been produced a malady characterized by fever, nasal and ocular catarrh, and spasmodic cough with vomiting. Young dogs inoculated often die of pneumonia in twenty-four hours. Klimenko has obtained an active toxin. Experimentally his serum has shown undoubted power. Guinea-pigs which have received an inoculation of toxin into the peritoneum resist a mortal poisoning if they have received a serum inoculation a half hour previously. This serum agglutinates; it contains specific opsonins, and causee deviation of the complement. The presence of bacteriolysis is not certain. Klimenko inoculated three children with favorable results in 1898. In 1910 he treated thirty-five cases, in all of which examination of the sputum showed the characteristic germ. The serum did not abort the disease, but it did diminish the violence of the attacks, and the number of them, especially at night. In twenty-four to forty-eight hours there was a modification of the attacks, the vomiting, and the general condition of the child. These were all severe cases, for uncomplicated cases are not taken into the hospital for treatment. The dose injected was 25–50 c.c. of the serum.

Treatment of Tuberculous Joints.—J. L. Porter (*Surg. Gyn. and Obst.*, 1913, xvi, 334) says that the most valuable procedure in the treatment of any tuberculous joint is rest and immobilization, in most cases for from three to five years with the best of care. Immobilization, to be efficient, must be continued until the joint is well. The writer's experience with the so-called Bier's treatment or passive hyperemia has been disappointing but he has not given it a thorough trial, while those who have used it most persistently and accurately claim good results. Radical operations should be avoided, if possible, in children. Where there is extensive destruction, not only of joint structures but of bone, with probable sequestra and invasion of periarticular structures, operation looking to a general clearing out of the infected area by clean incision into healthy tissue is undoubtedly warranted, and especially if the patient is doing badly. Certain joints are notoriously unfavorable for mechanical treatment in adults, as for instance, the tarsus while in children the same joint shows remarkably good results under mechanical treatment. Cases are seen, most frequently in young adult life, in which there is no resistance to the disease; the early toxemia is marked and profound, and the patient steadily and rapidly grows worse. In such cases the only indication is to separate him from his infected focus as completely as possible, even to the extent of amputation, and then give him the benefit of outdoor treatment, tuberculin, and every other possible measure. Excision of the articular surfaces of the knee looking to early ankylosis and tunnelling the trochanter and neck of the femur may be of value in selected cases. For several years the injection of antiseptic solutions into the affected joint and the surrounding tissues was a favorite procedure of some surgeons. The antiseptic most frequently used was iodoform, suspended in glycerin or oil. The writer remembers just one case where he thought it was helpful. He does not believe it is a rational surgical procedure to inject an insoluble substance blindly into a tuberculous area, in the hope that it may hit a spot where it may do some good; but in primary synovial cases in young adults he injects a mixture of 3 per cent. of formaldehyde in olive oil. Old infected sinuses he simply lets run, keeping the skin clean and depending upon the patients' resistance to finally close them. Tuberculous abscesses should be opened only when positive indications are present. When a tuberculous abscess is so situated or is so large as to interfere with mechanical treatment, it should be evacuated; also when it is burrowing so rapidly as to threaten the integrity of subcutaneous tissues to any considerable extent. When the patient has a persistent high temperature with indications of toxemia, and is doing badly, if an abscess is present, it should be evacuated. If the abscess shows signs of probable rupture, it should be evacuated. If secondarily infected, open and drain, and only then. Since abandoning the opsonic method of giving tuberculin, the writer has used it after the method suggested by Packard of Denver with more satisfaction. He advocates beginning with small doses, small enough to produce no reaction, and slowly increasing it in those cases which are neither doing well nor hopelessly badly, but those in which the patient has good resistance and needs only a little assistance. In so-called Pott's paraplegia, if the patient is promptly put to bed, with traction on the head, and kept continually in bed long enough, the paralysis usually disappears. It requires from six to eighteen months usually, but the author has never seen a case in which recovery from the paralysis has not occurred where the treatment was kept up for sufficient length of time. He has never seen any benefit for the *x*-ray treatment of tuberculous joints.

Fat, Lime and Nitrogen Metabolism in the Infant.—Aschenheim (*Jahrb. f. Kinderh.*, Bd. xxvii, Ht. 5) has investigated this subject with particular reference to these processes under normal physiological conditions, the children being supplied with food which fulfilled their caloric requirements as regards growth and development. It was his object to employ a food the fat content of which was reduced as much as possible and in the mixture which he employed the fat varied from 0.24–0.67 gram of fat per day. The technic for preparing the food must be read in the original. Aschenheim found that only the portion of his research devoted to the excretion of fat turned out of any general value, as the findings included in the calcium and nitrogen metabolism were surrounded by many sources of error which will need further confirmation by researches of other investigators. He found, however, that the demonstration of food free from fat and lime did not produce constipated stools and even if butter up to 20 grains per day was given very little change resulted. Even with the administration of food free from fat, fat is found in the stools, which must have been excreted by the intestines, but the quantity was so small that it could be disregarded in estimating the fat consumption in a fat-free diet. As far as could be ascertained the calcium metabolism stood in close relation to that of the fats.

Liver Insufficiency in Scarlatina.—Tachau (*Jahrb. f. Kinderh.*, Bd. xxvii, Ht. 5) presents the results of extended functional tests of the liver in this disease, including the demonstration of biliary coloring matter and its derivatives in the urine, tests for the carbohydrate tolerance and nitrogen distribution in the urine. In all the cases examined no enlargement of the liver could be made out by percussion or palpation. The author believes that a disturbance of the function of the liver exists in the beginning of scarlet fever because of the presence of a urobilinuria, alimentary levulosuria and increased excretion of amino acids. In the mild cases in which only a urobilinuria is present it is possible that we are dealing with a purely passive insufficiency resulting from an increased disintegration of red blood cells. In all cases, however, in which the nitrogenous excretory products are increased above the normal, an involvement of the liver parenchyma is present. The appearance of bile pigment in the urine as early as the fourth day is the only symptom of a functional disturbance and even in the well-marked cases the hepatic insufficiency is comparatively slight because the ingestion of 20 grams of glycocoll does not interfere with the excretion of amino acids. Tachau believes that the disturbances of the liver referred to are due to a specific factor which is the etiological basis for the disease.

Birth Palsy: Subluxation of the Shoulder Joint in Infants.—This condition, produced during birth, is due to injury of the brachial plexus or the nerves which form it by traction. H. A. T. Fairbank (*Lancet*, May 3, 1913) says that spontaneous recovery occurs in most cases. In his own series of forty cases the nerves appeared to have completely recovered, or show every sign of recovering at the present time, in at least 60 per cent. In several of the remaining 40 per cent. the residual paralysis affected one or more muscles of the forearm only, the bulk of the paralysis having entirely recovered. The supervention of a posterior subluxation of the shoulder-joint is a late result of the paralysis in these cases. Those cases in which the nerves recover in the usual, more or less, rapid manner, almost invariably develop this deformity, which constitutes the only hindrance to the complete recovery of the muscles and the movements of the arm. Excluding three cases seen before this point was appreciated, twenty-eight out of the remaining thirty-seven cases showed this deformity to a greater or less degree. The reasons upon which the writer bases his belief that the subluxation was preceded and caused by a birth palsy are a history of difficult labor in twenty-six of the twenty-eight cases; a history in twenty-three cases of the arm hanging limp and vertical at first, while six of the cases were actually seen soon after birth and this condition observed; the presence in the series of all degrees of displacement of the head of the humerus with all degrees of mobility up to fixation; and the presence of some residual paralysis which could not possibly result from pressure of the displaced head of the humerus.

Prognosis in Infantile Paralysis.—W. R. Townsend (*N. Y. State Jour. Med.*, 1913, xiii, 254) says that when a patient is first attacked prognosis must be guarded. If it is of the pontine or bulbar type, or in an epidemic, with a high mortality, or in the very young or the very old, prognosis is not as good as in other cases. The mortality may be put down as from 5 to 25 per cent. About 25 per cent. of the total affected may be of the abortive type. By the end of the second week electrical examinations may enable one to make a rather positive prognosis as to which muscles will be affected, but no definite conclusion can be reached as to how far they will be affected and what the ultimate results will be before the end of six months. If the reaction of degeneration is present one is justified in making an unfavorable prognosis as to the complete recovery of that muscle. Definite conclusions can be given by the end of a year as to what the ultimate results will be. Deformities both primary and secondary can be predicted and thus prevented.

Possible Danger in the Use of Antimeningitis Serum.—S. P. Kramer (*Jour. A. M. A.*, 1913, lx, 1348) reports that the sister, aged two years, of a child which had cerebrospinal meningitis was admitted with similar symptoms and 30 c.c. of antimeningitis serum were injected. The cerebrospinal fluid was clear and no meningococci were found. She improved rapidly after this treatment, so that by the third day she was afebrile, with no headache, the only symptom being a retention of urine. The following morning she had a temperature of 102 with headache, rigidity and Kernig's sign positive. At 11 A. M., 30 c.c. of clear cerebrospinal fluid were withdrawn under light anesthesia, and 20 c.c. of antimeningitis serum injected. The child received no anesthetic during the time of injection. About two minutes after the injection she suddenly stopped breathing and became livid, the pupils being contracted, the heart beating strongly. After three minutes of artificial respiration she again breathed normally and showed an internal strabismus of the right eye due to a paralysis of the right external rectus. An hour after, when the child became conscious, the nurse noticed a hemiplegia involving the entire left side of the body. The paralysis of the leg and face and right rectus disappeared that day. The left arm remained slightly paralyzed. The day following the injection, the child developed a marked urticaria and a consolidation of the left lung due to pneumonia, which proved fatal a week later. The records show six other deaths at the Cincinnati Hospital during the past year, immediately following the injection of the serum, all occurring in young children. These are described briefly by the writer, as well as two cases in which the respiratory paralysis was relieved by artificial respiration, the children dying later of the disease.

Because of their similarity to those cases of respiratory paralysis following the lumbar injection of cocaine the writer believes them to be toxic. He has explained the cocaine cases as being due to an open central canal of the cord leading directly to the fourth ventricle. It was shown that methylene-blue injected into dogs *intra vitam* into the subdural space might find its way through the central canal to the ventricular system of the brain. This circulation upward toward the fourth ventricle is aided by the ciliated epithelium lining the central canal. If, in a given case the passage exists, or if a needle introduced for the purpose of making an injection should injure the filum and make an artificial opening into the central canal, a direct channel lined with ciliated epithelium would be present which might in a few minutes deliver a toxic material injected into the subdural space to the fourth ventricle. The writer describes several injection experiments with antimeningitis serum and tricresol, showing their depressing effect upon respiration. He concludes that serum containing 0.5 per cent. tricresol, cannot safely be injected into the subarachnoid space.

Infantile Beriberi in the Philippines.—D. Gregg (*Bost. Med. and Surg. Jour.*, 1913, clxviii, 676) says that infantile beriberi in the Philippines is a nutritional disease which occurs among native breast-fed infants. It causes about 25 per cent. of the total native mortality in the city of Manila. It is due to the absence of some as-yet-unknown nutritional substance in the breast milk of the nursing mother. It has been successfully treated by the giving of an extract of rice polishings, which is believed to supply the nutritional substance absent in the mother's milk. In the Philippines, where babies are almost always of necessity breast-fed, the reduction of the infantile mortality is dependent, even more than in other countries, upon the care and proper nourishment of the nursing mother. The onset of the disease is insidious. The baby is plump and apparently well nourished; the face is sometimes almost swollen in appearance. Slight edema of the legs may usually be observed. Unless the infant is having a paroxysm of dyspnea or is in an advanced stage of the disease, it does not look sick, as it shows no paralysis and smiles and plays as a normal infant. Often the first symptoms noticed by the mother are restlessness, peevishness, a slight cough with dyspnea and perhaps cyanosis.

The skin and mucous membranes of the face may be slightly cyanotic. The heart is slightly enlarged to the left and occasionally enlargement to the right may be made out. The sounds are rapid, often clear; sometimes a slight systolic murmur is detected over the precordia. The pulses are rapid and often weak. The abdomen may be flat or rounded and tympanitic. There are tenderness on pressure and movement of the legs and slight edema over the shins. The knee-jerks are usually not obtained. The temperature is normal or subnormal. The baby may improve rapidly or he may have an acute attack of dyspnea and die suddenly. The cause of death is seemingly failure of the respiratory center. During a paroxysm the infant shows more and more marked dyspnea and cyanosis. The breathing often becomes Cheyne-Stokes in character and ceases before the heart stops.

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ORIGINAL COMMUNICATIONS.

PREGNANCY COMPLICATED BY APPENDICITIS.*

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THE brief time given in which to prepare a paper upon the subject of appendicitis in pregnancy has made it impossible for me to obtain reports of series of cases not already reported. Therefore, in treating this subject, statistics already furnished must make the basis of my conclusions. Had time permitted, no doubt several hundred operations for the complication might have been added to the present literature, as with but two exceptions I find by talking to different operators—surgeons, obstetricians and gynecologists, that each one has had a number of such cases which has not been reported.

I cannot agree with most writers upon this subject that the complication is an infrequent one, and, again, it is almost impossible to make even an estimate of its frequency. Physicians generally recognize the frequency of placenta previa, ablatio placenta, inversion of the uterus, etc., but they do not seem to be familiar with the complication in question, notwithstanding it is as frequent as any of the above-named complications, and its results more disastrous to both mother and fetus.

History.—Mistivies, in 1759, located an abscess in a woman, pregnant, at the eighth month, and at autopsy it was found that this abscess was caused by a diseased appendix due to a needle.

Stumpf, in 1836, observed general peritonitis in a puerperal woman, commenced twenty-four hours postpartum, and at autopsy it revealed a ruptured appendiceal abscess.

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*Read before the Joint Meeting of the Philadelphia Obstetrical Society and the Chicago Gynecological Society, at Philadelphia, May 9, 1913.

Hancock, in the Lancet, 1848, reports the first case of appendicitis complicating pregnancy, but it was not until in the nineties that decided attention was given to the subject and cases diagnosed and operated.

Korn, in 1885, reported a case which went to autopsy. The appendix was found perforated.

Mueller reported a similar case the same year.

F. H. Wiggin, in 1892, diagnosed a case and was the first to advise operation. The operation was refused and the patient died. At a postmortem examination the diagnosis was confirmed.

Paul Munde, in 1894, reported the first case in which operation was performed. The patient aborted at the third month and five days later an operation was performed and the patient recovered.

In commenting upon this, Munde said that as far as he knew there had been no case of appendicitis in pregnancy reported, but he could see no reason why such a condition should not occur. He thought that the infrequency in diagnosing appendicitis in women in the anteoperating days was because everything of this kind was attributed to pelvic disorders or peritonitis from other causes, and the women either died and no postmortem was held, or the abscess fortunately emptied into the bowel and the patient recovered.

McArthur, 1895, reported at length upon two cases, which will be mentioned later in this paper.

From 1888 to 1896, inclusive, v. Rosthorn found two cases complicating pregnancy in 27,000.

Abrahams, in 1897, was able to collect from the literature but seventeen cases.

From 1891 to 1902 Schauta reports 34,000 cases of pregnancy, with but four of them complicated by appendicitis.

Boijé was able to collect but seventy cases up to 1901.

In 1902 Rosner found twenty-two cases of appendicitis in 1500 cases of pregnancy.

J. B. Murphy, in 1904, reports 2000 cases of appendicitis, but does not mention the complication with pregnancy.

Treves, in 1905, reports 1000 cases of operation—appendectomy—319 were women, six pregnant.

In 1905, von Oordt said that he had observed the complication in only three out of 10,000 cases of pregnancy at the Rotterdam Maternity. Babbler found 235 cases of appendicitis complicating labor and the puerperium. Of the 207 occurring in pregnancy, 103 were the perforating and 104 nonperforating.

From this time on, however, we find the number of cases increasing, undoubtedly due to the stimulus of the above reports, and a better diagnosis. For instance:

Max W. Myer, in 1906, reported 143 cases which he collected in the literature.

Mount Sinai Hospital, 1898–1907, reports 2003 cases of appendicitis—731 in females, nine cases in pregnancy, two not operated. In both gynecological services there was not a case.

Lobenstine states that in the last 30,000 cases in the New York Lying-In Hospital and Dispensary there were five cases of acute gangrenous appendices—two recovered and three died.

Norris reports 445 women operated for appendicitis and six were pregnant.

In 1800 appendectomies Baldwin reports six pregnancies.

Vineberg saw nine pregnancies in 731 appendectomies.

E. Fraenkel reports five pregnancies in 40,000 appendectomies, and von Eiselberg thirteen pregnancies in 520.

It is interesting to note the wide variance in frequency in the reports of the different operators.

Renvall reported twenty-five cases in 1908 of his own, and 253 cases collected from the literature, and in 1911 H. H. Schmid makes a complete report of 486 cases.

The latter paper is the most extensive and comprehensive upon the subject and as his statistics and conclusions seem to be the most valuable, I will take the liberty of quoting frequently such statistics and results.

Lobhardt tries to explain that the infrequency of appendicitis in pregnancy is because of the congestion which exists in the pelvic and abdominal viscera due to the pregnancy, and that this congestion relieves the chronic inflammation which so often exists. That this theory is erroneous is proved by the fact that most of our cases have had previous attacks, and that the pregnancy, instead of decreasing such inflammation, increases it.

Our ability to diagnose better the complication is what has led to the apparent increase in the frequency. It is said that about one-third of our cases of appendicitis are in women, and as we said above we may account for the comparative infrequency of appendicitis in pregnancy because of the fact that the child-bearing period is of short duration and the actual time of pregnancy is only a few months. Another factor, however, which may figure in the etiology, and which one would think should render the cases more frequent is the frequency of the association of diseased appendices with diseased ovaries and tubes.

The etiology is, in the main, theoretical, and perhaps the same cause or causes assigned to appendicitis in the nonpregnant state should be given to the same condition in the pregnant.

It may be that the anatomical relation between the appendix and ovaries and tubes may have some bearing. Myer lays great stress upon the ligament of Clado as a means to carry this infection. He claims that the ligament serves as a direct lymphatic communication between the right ovary and the appendix.

Kelly says that in all his experiments in injecting the lymphatics of the appendix from the periphery to the center it was demonstrated that the lymph channels of the appendix pass inside of the mesoappendix toward the ileocolic group of glands, or through the cecum in the same direction ultimately to the same group. Not a single lymph channel was seen to pass in or toward the ovary.

It is quite probably a fact that there is no direct or special communication between the appendix and the pelvic structures, and if such a communication does exist, it is purely accidental and due to contiguity of the organs, which brings about the disease.

Schauta claims that venous hyperemia predisposed to enteritis and to the increasing virulency of the colon bacilli. Boijé claims that the increased circulation acts as a healing factor for the resorption of old areas of inflammation, especially in the early months.

Krönig says that pregnancy has no influence in the causation of primary appendicitis, but it does influence the chronic cases unfavorably.

Constipation is given as an etiological factor in the nonpregnant; doubly so, then, would it be accepted as one of the causes in the pregnant state. Again, the occasional contiguity of the appendix with an inflamed tube or ovary or adhesions which have been formed by old inflammatory conditions must be taken into consideration. Then, again, we have the mechanical irritation and displacement of a normal appendix by the growing uterus, which through this irritation might cause trouble. It would be interesting to note the condition of the patient before an attack of appendicitis in the pregnant state, whether she had suffered from unusual toxemia, as I believe that the toxemias which are so prevalent in pregnancy have much to do with the acute or primary attack. I believe, however, that the majority of the cases have been suffering from a chronic appendicitis, which has previously given but little trouble.

We have the same variation in symptoms as in the non-gravid case, but in addition to these there are conditions which are associated with pregnancy. A threatened abortion or a tubal pregnancy might be mistaken for an appendicitis. Ovarian cyst, nephrolithiasis, hydronephrosis, floating kidney, kidney tumors, and right-sided pyelitis are to be differentiated, as they frequently disguise the diagnosis. The latter condition, especially as it more nearly simulates the symptoms found in appendicitis. The majority of cases which in recent years have been sent to the clinics with a diagnosis of appendicitis in pregnancy have proven to be cases of right-sided pyelitis.

Cholelithiasis and cholecystitis and diseases of the liver and gall-bladder must also be excluded. In the second half of pregnancy the painful point is almost identical with those of hepatic origin, but icterus is usually absent; however, we may have a septic icterus in severe cases of appendicitis.

An appendicular abscess may be mistaken for the symptoms produced by compression of the right ureter. Vomiting of pregnancy and gastroenteritis are often taken for mild cases of appendicitis.

In the puerperium puerperal infection may be mistaken for infection due to a ruptured appendix. At the third or fourth day one would naturally attribute the temperature, pain and clinical picture generally to puerperal infection. Peritonitis from other causes, lead colic, tuberculosis, carcinoma, sarcoma, mechanical ileus, incarcerated inguinal hernia, stomach and intestinal diseases are not infrequently mistaken for appendicitis in pregnancy. In some of these conditions we do not have to be definite concerning the diagnosis, because an operation is indicated.

Muscular rigidity upon the right side is one of the most important symptoms in the nonpregnant, but it is not so dependable in the pregnant case, and many errors in diagnosis are made because of this fact. Vomiting also is frequently absent, and even pain may be absent in mild cases. Frequently the pain is confused with labor pains or after-pains.

Zweifel claims that in early pregnancy and the puerperium the pain is more often referred to the region of the liver, and perhaps to the left side rather than to the region of the appendix.

Fraenkel's method of diagnosis would be of value were it not for the dangers connected with it. He advises placing the patient upon her left side, which enables one to make a deep palpation upon the right side. It should be remembered, however, that in severe cases, through change in location of the uterus, adhesions are easily torn; also the examination in narcosis, recommended by Fraenkel and Oportz, is dangerous, as by the failure of pain one can palpate too deeply and rupture localized abscesses.

The leukocyte counts are only of relative value; in most severe cases where we have a high leukocyte count a diagnosis could have been made from other clinical findings. One always had to remember that a normal pregnancy has an occasional leukocytosis.

In the diagnosis Cooke places great emphasis on the percentage of polynuclear cells, while others have shown the unreliability of the leukocyte count.

Limitation of the diaphragmatic breathing and the high liver may be discarded, according to one authority, as the location of the liver and changes in respiratory movements are greatly altered in normal pregnancy. Great stress should be placed upon the history, particularly as regards the commencement of the attack, and it must not be forgotten that the appendix is sometimes on the left side. In the puerperium the diagnosis is most difficult, because, as we stated above, it is almost always mistaken for puerperal infection.

Zweifel claims that pain in early pregnancy and the puerperal period is apt to be referred to the region of the liver, and perhaps to the left side, rather than in region of appendix.

Krönig made a diagnosis of puerperal peritonitis after an artificial abortion. He found, however, an appendicular abscess opening into the uterus. Appendiceal colics, postpartum, are often mistaken for after-pains.

Hemorrhage in the puerperium may be considereed a symptom of endometritis puerperalis, when, after all, it may be due to the disturbance caused by adhesions formed by the inflammation due to an appendicitis in pregnancy.

Diagnostic errors, according to Pankow, are not infrequent; for instance, the occasional compression and dilatation of the right ureter and the resulting ascending infection from stagnant urine has been met with. But even here he says that if there be any considerable doubt an exploratory laparotomy should be made.

Pinard suggests that the appendix be regarded as the offending organ in all cases where the pai n is on the right side, and no other cause can be found for it.

Depending upon the time in pregnancy will the location of the pain be changed. For instance, in the first three months the pain, as a rule, would be referred to McBurney's point, and would rise in the abdomen with the growth of the uterus. At operation in late pregnancy the appendix has been found well up under the liver.

The pain is usually spasmodic and is said to resemble labor pains. This is probably due to the pressure, as the uterus normally contracts in pregnancy. Usually the involvement of the peritoneum is more rapid and goes on to suppuration much sooner.

Pinard says, regarding the diagnosis, that it is easy; on the other hand, Cooke says it is not easy. Babbler says the diagnosis should be made as readily in the pregnant as nonpregnant state.

Treves calls attention to the impossibility of distinguishing clinically between chronic appendicitis and chronic ovaritis.

Babbler found that 75.7 per cent. of the cases occurred after the third month of pregnancy, which might show the result of stretching and tearing of adhesions. The symptoms are practically the same as in the nonpregnant, but the diagnosis must of necessity be much more difficult.

Futh says that he is convinced that there is a dislocation of the cecum from the iliac fossa upward and encroaching on the border of the liver and further to the right, corresponding to the always increasing bulging of the anterior wall from behind forward. This pushing forward begins as soon as the uterus leaves the pelvis. Doubtless this dislocation of the cecum, with the appendix out of its customary position and into the free abdominal cavity has, according to Futh, a clinical significance, in that with the formation of an abscess this takes place in a much more dangerous place, because of its being higher in the abdominal cavity. Through this change of position of the cecum one can, as E. Fraenkel has demonstrated, palpate the cecum much more easily by putting the patient upon her left side. It would seem, from reports of all observers, that this dislocation of the cecum and appendix is the rule.

It is an indisputable fact that appendicitis occurring in pregnancy gives a serious prognosis. The maternal mortality, according to Rosmer, is 59 per cent.; Heaton says 50 per cent., and Abrahams 53 per cent. The mortality of the babe, according to Abrahams, is close to 100 per cent. Notwithstanding there is an occasional case which goes to full time, abortion or premature labor is the rule. (Pankow.)

Appendicitis occurring during pregnancy can pursue many different courses—there are unusual cases, just as there are in the nonpregnant, which do not present any threatening symptoms and quickly disappear without interruption of pregnancy. This class of cases in later years is frequently reported and probably helps swell our statistics, while a few years ago the tendency was to report only the more severe cases. It is highly probable that these mild cases (earlier) were overlooked or not carefully observed.

The severe cases of appendicitis present many different forms, just as in the nonpregnant, with a greater or less involvement of the peritoneum, and because of this insult to the peritoneum there is usually a termination of the pregnancy, with a most unfavorable prognosis. An appendix filled with pus, or well-encapsulated appendiceal abscess, through repeated contractions and sudden change of position, soon empties its contents into the free abdominal cavity. In the nonpregnant state this influence is lacking, and the prognosis is necessarily more favorable.

Most of the cases of what may seem moderately severe, as described by Schmid, begin with an acute attack, soon followed by labor pains and symptoms of peritonitis, rapidly followed by expulsion of fetus. The general condition gradually becomes worse, and death occurs. On the other hand, we find many cases which begin without any threatening symptoms and are exceedingly puzzling. They lead to abortions, and from this to a very rapid inflammatory process and a fatal peritonitis. In cases of abscess formation, when the wall of the abscess is the uterus, the history is that the cases usually abort and die. In these cases a natural healing process goes on until labor begins, and as uterine contractions go on the clinical picture is changed, and general peritonitis and death follow.

Myer collected in the literature and reported upon 143 cases. Of these, sixty-nine were operated during pregnancy; fifty-two not operated. There were twenty-two operative and nonoperative cases during the puerperium.

Of the sixty-nine cases operated, a gangrenous appendix or abscess was noted in forty-nine cases—seventy-one per cent. The attack was observed before the fifth month in 58 per cent. of the cases, and 25 per cent. after the fifth month. In this list of 143 cases there were seventeen with a chronic catarrhal appendicitis operated and with no interference with pregnncy.

Thirty-seven per cent. of those operated upon for abscess aborted and in eleven cases, or 10 per cent., abortion occurred before operation.

Boijé collected thirty-one cases of acute appendicitis operated, with a mortality of 41 per cent., and an interruption of pregnancy in 58 per cent.

Vinay, in fifty-two cases of all kinds, reported abortion in 40 per cent.

Hergoth, many years ago, made the statement with emphasis that every case of appendicitis occurring in a woman within the child-bearing period should be operated. Fraenkel does not endorse the dictum of Hergoth, but Pankow says that "it is undoubtedly justified when we recall the sorrowful results of appendicitis complicating pregnancy."

Meyer claims that the maternal mortality in appendiceal abscess cases operated upon is 32 per cent. When an abortion precedes or directly follows the operation the mortality is 55 per cent.

There are cases which from the very beginning pursue such a rapid and severe course, and death occurs before the fetus is expelled. Of forty-seven severe cases reported by Schmid, thirty-seven died.

Acknowledging the difficulty of making a diagnosis in early appendicitis, when once made I believe the treatment should be immediate appendectomy. After the operation pregnancy will continue and the fetal mortality be practically *nil.* It seems to me that the only excuse for not operating immediately is when the patient can be under exact observation and a surgeon always available. True, a great many of these cases recover and no more is heard of them; on the other hand, any woman who has catarrhal appendicitis is almost sure to have one or more attacks during her pregnancy.

Goedecke reports sixteen cases of pregnant women who had had an attack of appendicitis prior to the pregnancy, and eleven of these suffered from recurrent attacks during the pregnancy.

I hardly believe it is best to follow the dictum laid down by Munde many years ago, when he said: "Treat the disease early, regardless of pregnancy," for that would mean in the majority of early cases to wait until another attack. We do not know how long a mild case is going to remain one.

There are several different opinions concerning the treatment, and we find many operators advocating the most radical means.

Then there are many who take a conservative view, and some of these take a decidedly moderate stand, and say: "Treat according to your surgical principles, as you would if no pregnancy existed." What are those surgical principles? It is the rule of the Clinic Eiselberg to operate within the first forty-eight hours of an acute attack of appendicitis, and after this time it is the experience of the clinic that it is less dangerous to wait with knife in hand. Only in demonstrable abscess or in a general peritonitis after forty-eight hours is immediate operation indicated. This we understand is the conservative treatment accepted generally by surgeons in the nonpregnant cases. This is certainly to be commended, but can such treatment rationally be applied to cases complicated by pregnancy? We must take into consideration the fact that in a large percentage of the cases abortion or premature labor is going to occur, and the adhesions will be torn, and a general peritonitis result. The consideration of the fetus should not influence us in deciding the operation. The danger of waiting is too great, and in any stage is greater than operating.

Again, we must take into consideration the invalidism which of itself brings added changes, such as subphrenic abscess, hernia, thrombosis, etc., which so frequently come in our severe cases.

The surgical treatment of the abscess of appendiceal origin is exactly the same as in the treatment of the nonpregnant: Appendectomy, if the appendix can be reached without disturbing the adhesions; otherwise, incise and drain.

In the puerperium it is advised to await interval operation, particularly if the disease occurs in the last days of the puerperium, because now there is less danger of tearing adhesions. But if the attack comes on in labor or in the early hours of the puerperium, it is best to operate at once. When pregnancy is interrupted because of infection, it generally signifies a severe type of infection and calls for operation immediately. It must be accepted as a fact that appendicitis complicating pregnancy and the puerperium is more rapid in its course and more virulent than in the nongravid condition, and waiting for a better time to operate is only giving the abscess more time to locate itself upon the uterine wall, to destroy by infection the fetus, and to start up labor. Labor invariably ruptures the adhesions and the abscess contents are poured into the abdominal cavity.

Schmid considers a case which has gone beyond forty-eight hours an intermediate operation, and in this class of cases the maternal mortality is exceedingly high. In the nonpregnant state rarely would the case have continued to this intermediary stage, but as we have stated the diagnosis is usually made so late that forty-eight hours or more have elapsed before operation is done. We, of course, may have several different conditions existing in or about the appendix at this time, and the purely catarrhal variety usually will subside, but the etiological factor is undoubtedly present, and one other, and perhaps a severer attack, may occur. There may be all grades between this and a general peritonitis.

Operation upon the simple catarrhal variety or even where the infection is confined to the formation of pus, with no involvement of the peritoneum, results usually in no danger to the mother, nor is there in the cases an interruption of the pregnancy.

Where, however, there is a diffuse peritonitis, the prognosis from operation is very unfavorable. Schmid reports fifty-five such cases in his series, eleven recoveries, and one infant saved.

An appendiceal abscess is usually, when operated, an intermediate operation. It has taken some time to form. Now, it is claimed, and rightly, that one wall of the abscess is formed by the uterus after the third or fourth month of pregnancy. Whether due to the irritation of the tumor, the infection of the uterine wall, or even placenta by the abscess contents, it is a fact that the uterus is usually prematurely emptied, and the adhesions are broken and the contents of the abscess are thrown into the peritoneal cavity. Here, then, we have a condition which is dangerously influenced by the pregnancy. In the nonpregnant the clinical picture could be entirely different, the abscess finally might drain, if left alone, into the intestinal tract, bladder, etc.

Of seventy-eight cases collected by Schmid where operation was done, sixty-two recovered and sixteen died.

In twenty-four the pregnancy continued, which is a higher percentage than is usually noted. The pregnancy was interrupted eighteen times before operation, and twenty-one times after operation, and once birth and operation were coincident.

Of ninety-two cases of abscess which occurred in pregnancy and the puerperium, seventy-four lived and eighteen died.

The intermediary operation was done in all classes of cases or conditions 186 times, with a mortality of 73 per cent.

The so-called intermediary cases must not be classed with the interval cases, whether catarrhal or abscess. In this class the mortality is not nearly so great, nor is there as much danger of premature labor.

Light cases of appendicitis in pregnancy usually run a favorable course, whether operated or not. Rarely does an appendicitis primarily occur in pregnancy. Severe cases, however, through the interruption of the pregnancy, render the complication highly unfavorable.

Boijé, Renvall, Williams and others have expressed the view that uncomplicated catarrhal appendicitis has no unfavorable influence upon pregnancy. But with a complicated or serious case, where the peritoneum is involved, the uterus is injured to the extent of causing contraction, and abortion, in a large percentage of cases. We can only theorize regarding what takes place to produce this effect, but that it does act unfavorably upon the fetus is established, destroying the fetus, at the same time causing contractions of the uterus. Perhaps more careful and scientific examination will enable us to determine more definitely the mode of infection of the uterus and fetus at this time.

It has been mentioned that habitual abortion, to which no cause can be assigned, may and has been traced to a chronic appendicitis, and there are a number of reports of operations on the appendix for abortion.

The operated suppurative cases show an infant mortality of 36.4. Operated diffuse peritonitis—the infant mortality is 89.4, and those cases with abscess unruptured show an infant mortality of 69.2.

Schmid claims that "operation is much easier and results are less dangerous to mother and child in advanced pregnancy if the incision be made as far laterally as possible in the vicinity of the anterior superior spine of the ilium.

"The pararectal incision at most is only available in the earliest months. The median incision is to be discarded absolutely. All methods which do not consider the point of not moving the uterus are to be disregarded. If by an uncertain diagnosis the median incision has been done and it proves to be the result of an appendiceal inflammation, one should at least consider the advisability of sewing up the median wound and making a second one laterally; also when delivery is threatening or the pregnancy continues, the lateral incision has the advantage."

Drainage through such an incision in first days of the puerperium will be the least interrupted. In many cases, when abortion occurs, it is found that the abortion is due to unnecessary handling of the uterus. It must not be disturbed. The fact that you can do this without interrupting pregnancy, even when the uterus has been manipulated, does not prove to the contrary.

Those operators who have had a series of cases of appendicitis complicating pregnancy are better able to talk intelligently upon the treatment than those who have had none. We will quote a few of them.

Findley has had fifteen cases in his last report, and says: "I would not go so far as does Fraenkel in advising the removal of the appendix in all attacks, both mild and severe, occurring in the course of pregnancy. When the attack is mild, unless oft repeated, it would seem advisable to postpone operation until the end of the puerperium. When there is a definite pronounced attack in the course of pregnancy or the puerperium the demand for immediate operation is imperative in view of a possible rapid and destructive course. The earlier in the course of both pregnancy and appendicitis the operation is performed, the better will be the result. When an appendiceal abscess is recognized, drainage should be established without delay, because of the great liability of rupture of the abscess into the peritoneal cavity. This applies as well to abscess formation at the beginning of labor when the contracting uterus would be so liable to disseminate the pus. The greatest caution must be exercised to prevent the contamination of the genital tract by the escaping pus.

"It is seldom that pregnancy is interrupted in the course of a mild attack of appendicitis, but it is the rule that pregnancy is interrupted in the course of severe attacks. When operation is performed in such cases, every precaution should be taken to prevent miscarriage. In operating, the uterus should be carefully guarded from undue handling and exposure and after operation opiates should be administered to the patient and absolute rest enjoined.

"In severe attacks occurring at the end of pregnancy and without evident abscess formation, the rule should be to induce labor and to remove the appendix at the completion of labor."

Schmid, who has given us the most extensive report and whose conclusions must be of great value, says: "(1) Appendicitis in pregnancy is a relatively frequent complication. About 2 1/2 per cent. of all women having appendicitis are pregnant. One per cent. of all pregnant women complain or suffer from appendicitis. (2) Pregnancy in itself does not appear to favor the occurrence of appendicitis, but it does appear to favor the occurrence of the rezidiven—the connection between the two being not clear. (3) Mild cases of appendicitis run their course, as a rule, just as in nonpregnant state. Severe cases, however, through the interruption of pregnancy, either from abortion or premature labor, or normal birth, are mostly influenced in a very deleterious manner. (4) Through the involvement of the peritoneum pregnancy is interrupted if no operation is performed, in the majority of the cases, and, further, the appendicitis produces disturbances in the process of the involution of the uterus. The formation of adhesions may cause habitual abortion, extrauterine pregnancy and hyperemesis gravidarum. (5) The prognosis is generally bad—not so much because of the pregnancy *per se*, but because of the termination of the pregnancy on one side, and the delay in correct treatment on the other. (6) Only in the mild cases is conservative treatment indicated, and then only when one can have the patient under minute observation. (7) Barring this, the operation is always to be recommended, and emphatically the early operation is the one of election. (8) In the intermediary stage (after forty-eight hours) it is absolutely indicated to operate at once in contrast to waiting for the attack-free interval, as we are accustomed to do in the nonpregnant. (9) Artificial interruption of pregnancy is absolutely and under all circumstances to be discarded as irrational. (10) If there be no indications of beginning labor, the operation should be done just as in nonpregnant, only with the reservation that the incision be made as far laterally as possible, and do not move or disturb the uterus. After the operation opiates are indicated. (11) After the operation, when the peritoneum has been involved and provisional closing of the peritoneal cavity has been made, and interruption of the pregnancy is imminent, it is advised to empty the uterus according to conditions, either through forced dilatation or through vaginal Cesarean section, and then only after applying definite drain. (12) In favorable cases, when operation has recently been done, protect the fresh scar by assisting the labor."

Williams: "Operation is indicated in all cases in the early months. Later in pregnancy the presence of the enlarged uterus renders it difficult to expose the parts satisfactorily, and may seriously interfere with proper drainage, should it prove necessary. In view of this difficulty, it has been suggested that the uterus be emptied by accouchement forcè before opening the abdomen. I, however, do not believe that it is necessary, and am convinced that its general adoption will add to the gravity of the operation. In the early months abortion is not likely to occur, provided the uterus has not been subjected to much manipulation; in the latter months premature labor is frequently observed, particularly in cases of abscess formation. It may be due to one of several factors: Manipulation of the uterus, fever, and when an abscess has formed, to the direct transmission of bacteria from it to the fetus."

Hirst (Textbook of Obstetrics): "(1) If the patient has an attack of appendicitis during early pregnancy, especially if she has had an attack before, operation should be advised. It is easy in the first half of pregnancy, and should not endanger the continuance of gestation. An operation after the fifth month, on the contrary, is much more difficult, and if an attack occurs late in gestation, in consequence of intense congestion and increased abdominal pressure, it is likely to be very severe, with early perforation and virulent peritonitis. (2) If there is reason to suspect suppuration, the median incision is required in operations after the fourth month. The uterus should be lifted out of the abdominal covering to detect possible areas of suppuration deep in Douglas' pouch, or on the left side. If there is no suppuration or peritonitis, the lateral incision is much better and safer. (3) If it is necessary to deliver the uterus from the abdominal covering after the seventh month, it should be emptied by a Cesarean section, before it is replaced in the abdominal covering. (4) Diffuse suppuration and the necessity for drainage are not necessarily incompatible with recovery or the continuance of pregnancy."

McArthur, in 1895, reported two cases, being one of the pioneers in the diagnosis and treatment of appendicitis complicating pregnancy, and was the first to recognize that the uterine wall formed part of the abscess wall. He said at that time that from the standpoint of the general surgeon, at least, it would, therefore, be best, after treating the abscess and before closing the abdominal wound, to empty the uterus, in order to establish those relations of the structures concerned in the inflammatory process which we desire to maintain after closure of the abdominal wall.

In a recent talk with Dr. McArthur upon this subject I conclude that he is still of the same opinion.

The therapy of appendicitis, according to Pankow, in pregnancy is "in acute attack the stand to take is absolutely a surgical one and in all cases we are to carry out the operation without in the least disturbing the gravid uterus. It is to be remembered to make the incision somewhat higher and more lateral, as Futh has demonstrated that the growth of the pregnant uterus carried the cecum and appendix upward."

"The therapy in the intermediate stage should show an inclination to operation, the only exception being the great improvement in the patient's condition when first seen, and the symptoms very mild. Under those circumstances one may temporize. Such a case, however, must be in a hospital and under strict observation. At the first sign of a premature birth one must operate at once." "The uterine contractions and the diminution in size of the uterus after birth are exceedingly dangerous in this stage, as the fresh adhesions tear" (Pankow).

Davis says "that in view of the serious consequences which follow appendicitis, the appendix be removed in pregnancy as soon as the inflammation attacking that organ can be diagnosticated, remembering the impossibility of differentiating between inflammation of the right Fallopian tube and ovary and inflammation of the appendix. Complicating pregnancy, operation should be done without waiting to make a positive diagnosis that the tube is inflamed and the appendix not affected, or that the contrary is the case."

Summary of Myer.—(1) Of 143 cases collected, fifty-two occurred during pregnancy and were not operated; sixty-nine cases operated during pregnancy; while twenty-two both operative and non-operative occurred during the puerperium. (2) Pregnancy does not predispose to development of an appendicitis. (3) If appendicitis has previously occurred, there is usually a recurrence of the attack during pregnancy, and it runs a more aggravated course, as evidenced by perforation and abscess in 50 per cent. (4) The uterine adnexa and uterine contents may readily become infected during pregnancy from an appendiceal abscess. (5) The same surgical principles are applicable when the complications of pregnancy exist, as in uncomplicated cases. (6) Operation itself does not disturb pregnancy. No case of operated chronic recurrent appendicitis was disturbed. (7) When the complication of abscess existed, 57 per cent. aborted, regardless of the method of treatment. (8) Every care should be employed not to disturb the pregnant uterus during operation, for our prognosis improved with the amount of time which elapses between the operation and the abortion, or labor. (9) Abortion or labor following within twenty-four or forty-eight hours after operation gives a maternal mortality of 55 per cent., an increase of 23 per cent. over the general mortality of this class. (10) Maternal: First class, 14 per cent.; second class, 32 per cent.; third class, 14 per cent., giving a general mortality of 28 per cent. (11) Fetal mortality: First class, 20 per cent.; second class, 55 per cent., giving a general mortality of 40 per cent.

J. Clarence Webster says that: "The occurrence of appendicitis soon after labor is in some cases undoubtedly due to the mechanical changes in the uterus and adnexa. Under these circumstances an appendix may be stretched, twisted or even ruptured, and a severe local or gynecological infective process may be started, and the wall of the uterus may be infected. Doubtless, such an attack is not infrequently diagnosed as puerperal infection in the absence of careful bacteriological examination of the interior of the uterus, and because the symptoms of acute peritoneal infection of appendiceal origin may resemble so closely those following extension from the tube and uterus."

In the treatment he says "every nonpregnant woman who is likely to become pregnant, in whom a definite attack of appendicitis has once occurred, should have her appendix removed before pregnancy is allowed to take place, as a prophylactic means. When the condition is diagnosed for the first time during gestation, or when there is a recurrence of an old attack, it is advisable to operate as early as possible. The earlier in pregnancy the operation is performed the more satisfactory the result, and the stronger the abdominal wall if the patient goes to full term. In all acute cases in advanced pregnancy empty the uterus and then do the abdominal operation."

"When an attack of appendicitis occurs during labor, operative interference should be carried out very soon after delivery, and abdominal operation should also be performed when the disease develops in the puerperium. The method of incision generally favored is the McBurney."

Marx advises that accouchement forcé be done in all acute cases in advanced pregnancy, and this followed by the abdominal operation. Webster says "this suggestion is a good one, because it enables the abdominal drainage which may be necessary to be more thoroughly carried out. It would not, however, be advisable to adopt this procedure in cases in which a localized abscess is present, because of the risk of rupturing the abscess by the change in size and position of the uterus, which may form part of the abscess wall."

The treatment, according to Coe, is to "carry out the same line of treatment in the pregnant woman as in the nonpregnant. In a mild case, carry the patient through pregnancy, if possible, and operate as soon as convenient after delivery if the usual evidence of appendicular trouble continues. Since why should the woman be exposed to further risk during a subsequent pregnancy? In the presence of perforation and abscess formation, operate without delay, disturbing the uterus as little as possible and draining freely. Opium given freely after operation to prevent contraction."

The following reports of cases have been hastily dictated to me by the operators, and are not, therefore, as complete as they should be. However, they illustrate the general character of the condition as it comes to the surgeon, and also gives us an idea as to the frequency of this complication. As I said in the beginning of this paper, every surgeon has had one or more of such cases.

S. C. Plummer; "I make it a rule to operate promptly on all cases of appendicitis seen in the early months of pregnancy. I invariably have good results in these cases, no interference with pregnancy resulting.

"Although I have had no occasion to operate on cases far advanced in pregnancy, I would be inclined to follow the same rule, that is, to operate at once, even at a risk of bringing on premature labor.

"My conclusion as to the propriety of this course is the result of experience in two cases, of which I will briefly give you the main points.

"*First.*—Young woman, advanced five months in her first pregnancy. I saw her in a mild attack of appendicitis and advised noninterference. Two months later this patient had a severe attack which made operation imperative. There was a small amount of pus outside of the appendix, and the appendix was difficult to locate, on account of the size of the uterus. A fecal fistula resulted. Seventeen days after the operation the patient was delivered of a premature child which died in a few hours. The patient made a very slow recovery. The fecal fistula finally healed after many weeks, but it was many months before the patient had regained her normal state of health. After about two years she moved from the city, and I have been informed was operated on later for ventral hernia.

"*Second.*—Was called to see a woman who was beginning to have labor pains at term. There were undoubted symptoms of appendicitis, but, owing to the fact that labor had begun, I advised noninterference. The patient was delivered without great difficulty, and made fairly favorable progress for four days after delivery. She then showed signs of pronounced sepsis, and I opened and drained a very large appendiceal abscess. In spite of this she died of sepsis a few days later."

Dr. A. B. Kanavel, of Chicago, has had four cases of appendicitis complicating pregnancy.

CASE I.—Mrs. C., para-i, in the third month of pregnancy. Acute infective appendicitis. Plastic exudate. Temperature 101°. Appendix removed without drainage. Opiates. Uneventful recovery. This patient had suffered more or less from indigestion for a year, but with no evidence that she had appendicitis.

CASES II and III give a similar history, with operation and recovery.

CASE IV.—Para-i, twenty-two years, pregnant three and one-half months. Fifth day after attack, temperature of 103°; operated. Large abscess drained. Abortion followed the next day. Patient died two days later.

Dr. H. M. Richter, of Chicago, reports the following case: Appendicitis at third month of pregnancy. Was not at first recognized by the attending physician. At third day of attack, operation, and gangrenous appendix found. Right rectus incision. Recovery. In this case the operator said the lesson drawn from this operation is that had the woman been operated at once in the acute attack, she would have been saved the necessity of having drainage and subsequent hernia. The pregnancy in this case was interrupted.

Dr. W. B. Dorsett, of St. Louis: CASE I.—Mrs. L., aged thirty-five. Fourth pregnancy, at the eighth month. Sudden pain in the right side. Five hours later was seen by her physician. Pain continued with distinct resistance at McBurney's point. Saw the patient twenty-four hours after birth. The pulse very bad and a high temperature. A distinct tumor could be palpated over the appendix. Immediate operation at the residence. Large abscess found and drained. Patient died in twelve hours.

CASE II.—Para-ii. Patient had had two previous attacks. When first seen, was about seven and one-half months pregnant. Diagnosis made by general symptoms as appendicitis. Operation. General peritonitis. Patient delivered of a dead fetus. Died the seventh or eighth day after operation of general sepsis.

CASE III.—Patient in the fifth month of pregnancy. Had had two or three attacks previously. Operation in the interval. Appendix found attached to right ovary and a coil of small intestine. Patient made a good recovery and carried fetus to full term.

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OVARIAN NEOPLASMS, COMPLICATING PREGNANCY AND LABOR.

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To introduce for your discussion the topic assigned to me, a review is in order of those facts in the obstetric life history of ovarian tumors which have crystallized from the studies of this subject in recent years and concerning which experienced obstetricians and gynecologists are practically agreed. The more important debatable questions will then be offered for your discussion.

Ovarian tumors are rarer obstetrical complications than fibroids. They are encountered, probably, once in 3000 pregnancies. According to McKerron,(1) 68 per cent. have been simple and multilocular tumors; 23 per cent. have been dermoids; fibromata and solid adenomata have occurred in 2 per cent., and malignant growths in 5 per cent. of the cases.

Pregnancy, as a rule, does not cause the increase in growth in ovarian tumors noted in fibroids, but some of the complications that arise in the life history of ovarian tumors are more likely to occur during pregnancy. This is true of attacks of peritonitis followed by adhesions, and of torsion of the pedicle when the tumor is above the pelvic brim, and especially in the puerperium when the frequency of torsion is said to increase threefold. In 113 cases collected by Rushmore,(7) in 1909, torsion of the pedicle occurred in the first half of pregnancy in 80 per cent; during the third and fourth months, in 58 per cent. Pressure symptoms are aggravated, and rupture and suppuration, the latter especially in dermoids, are accidents more commonly observed when the tumor is small and remains in the pelvic cavity, often undiscovered until acute symptoms occur. Serious complications, either during pregnancy, labor, or the puerperium, may be expected in 25 to 30 per cent. of all cases, and from 16 to 20 per cent. of the pregnancies will terminate prematurely. Of ninety-five cases treated expectantly, and collected by Patton(5) in 1906, rupture during or after labor, occurred in 10; torsion of the pedicle in 25; torsion and hemorrhage after labor, in 3; suppuration, in 6; peritonitis, in 3. The pelvic-bound tumors, especially dermoids and intraligamentary growths, are most serious complications of labor, and in the puerperium, any kind of ovarian tumor is a menace, from twisting of the pedicle, necrosis, bruising, hemorrhage, and infection.

TUMORS COMPLICATING PREGNANCY.

From a careful study of recent statistics, including those of McKerron,(3) Marshall,(6) Graefe,(4) Orgler,(1) Heil,(2) Rushmore,(7) Patton,(5) and others, I find that expectant treatment of an ovarian tumor discovered during pregnancy, carries a danger to the mother, three times as great as that of early operation. If operative interference occurs prior to the fifth month of pregnancy, the chances of saving the fetus are three times as great as those of expectant treatment. If operation is delayed until after the middle of pregnancy, the proportion of interrupted pregnancies is much increased and is about the same as that of expectant treatment. The maternal mortality rate under expectant treatment, is about 10 per cent. Under operative treatment, it had fallen, in 1902, to 3.3 per cent. Graefe,(3) in 1905, collected 215 cases with a maternal mortality of 0.47 per cent., and Marshall,(2) in 1910, collected 137 cases published since 1903, with only one death following removal of a suppurating cyst.

The problems of treatment may conveniently be discussed under two classes of cases: (1) Tumors situated above the pelvic inlet, and (2) tumors occupying or impacted in the pelvic cavity. These two groups of cases for practical discussion, should be further subdivided into the proper treatment during pregnancy, labor, or the puerperium. Early diagnosis is the key to the situation. The location of the tumor, whether abdominal or pelvic, and its probable character, whether simple, multilocular, or dermoid, or infected and adherent should, if possible, be determined. The importance of routine pelvic and abdominal examination in all cases of pregnancy not later than the third month, needs no emphasis in this presence. An ovarian tumor, whether abdominal or pelvic in situation, recognized prior to the first half of pregnancy, should always be removed without delay, except when cardiac, kidney, or other grave systemic condition contraindicates a general anesthetic. In such cases promising obstetrical complications, the use of local or nitrous oxide and oxygen or spinal anesthesia is justified. My choice would be nitrous oxide and oxygen.

The claim of Fränkel, that the corpus luteum, by its internal secretion, is essential to the fetus, and the continuance of pregnancy, at least during the early months, has been to some extent, accepted, but the results of double ovariotomy on pregnant women, as reported by Graefe,(5) in which only four abortions occurred in twenty-three cases, and those of Cathala,(8) eleven cases with only two miscarriages otherwise readily explained, indicate that Fränkel's theory should not interfere with early double ovariotomy on pregnant women. A cystic, nonadherent pelvic tumor, discovered early in pregnancy, may be removed per vaginam if the surgeon prefers, and is specially skilled in vaginal celiotomy. A possible complicating abortion is alone sufficient to make me prefer the abdominal route. The vaginal route often entails greater manipulation of the uterus, and sometimes meets with technical difficulties in dealing with the pedicle. Its statistics show a larger number of abortions. It should only be undertaken by one able to make an exact diagnosis of the tumor, of its contents, and of its freedom from adhesions and infection, and the operator must be ready at once, to open the abdomen, should the unexpected in diagnosis happen. Although some German authorities recommend the vaginal route, notably Dührssen and Wertheim, there are few American surgeons who would today choose the vaginal operation.

After the sixth month of pregnancy, the necessity for immediate operation is not always plain. Opinions differ on this question. Expectant treatment until just prior to term, adds, it is true, a risk to maternal life, which can be discounted if the patient is kept under close observation. It, however, increases slightly the chances of saving the infant. At least, that is the lesson taught from statistics. They are frequently misleading, as all know.

I believe that the child's interest should be considered and further, that the necessity for immediate operation during the latter half of pregnancy, depends, to some extent, upon the history, the location, and the character of the growth, whether abdominal or pelvic, cystic, solid, dermoid, malignant, or inflammatory.

Torsion, pressure, rapid growth, and rupture, are accidents more common in tumors situated in the abdominal cavity. The frequency of such accidents, and the relative ease with which cystic and even semi-solid abdominal tumors may be removed without disturbing the uterus, and without inducing premature labor, justify their immediate removal at any period of pregnancy. Dermoids constitute about one-fourth of all ovarian tumors complicating pregnancy, and are prone to find a pelvic position. Broad ligament growths are also likely to have a low situation. It is in that class of cases that several unfavorable conditions may arise during an operation performed after the sixth month, which may then and there necessitate sacrificing the child's chances, and add to the risk of the mother. (1) In the first place, eventration of the uterus may be necessary to properly and safely enucleate the pelvic-bound tumor. That adds risk of premature labor. (2) While it is true that after the seventh month, progressive closure of the abdominal incision from below upward, by continuous layer and reinforcing interrupted sutures, often will force the eventrated uterus into the abdominal cavity and keep it there, it will not always do so, and one may be compelled to sacrifice the nonviable fetus by an enforced Cesarean section, perhaps in a dangerously contaminated field, that may, for the mother's safety, require even the sacrifice of the uterus, and all hope of offspring. (3) If the patient has safely passed the eighth month, and operation is contemplated without Cesarean section, the freshly united scar in the abdominal wall is ill adapted to the strain of labor so soon to follow. (4) Finally, a deferred operation, in the child's interest, might be justified when bilateral tumors are recognized late in a pregnancy that offers the only probable offspring. One would hesitate to risk that chance of maternity with that which follows a possible resection of an ovary at the time of operating.

If the child's interests are considered, it is my conviction that pelvic-bound tumors, first discovered after the middle of pregnancy, should be under continuous observation, and so long as there are no symptoms of danger, their removal may be delayed until just before term, with the expectation of securing a living child at that time.

Tumors Complicating Labor.—As stated above, an ovarian tumor complicating labor is a serious menace to the patient's life, especially when the tumor offers a mechanical obstacle to the passage of the child. An abdominal tumor, if not a mechanical obstacle, may be guarded against its greatest danger during labor, namely, rupture, by early and skillful obstetric interference. Mechanical dilatation of the cervix, and avoidance of the straining of the second stage by using forceps, will usually suffice. The patient having been delivered safely, the tumor should be removed in the puerperium upon the slightest evidence of torsion or inflammatory reaction. Tumors obstructing the birth canal during labor, call for early and definite surgical treatment. Attempts at reposition, assisted by posture, deep anesthesia, and the introduction of the entire hand in the vagina, should be undertaken only by one capable of exact diagnosis, and thoroughly acquainted with its dangers, and ready to perform an immediate abdominal section. It is so dangerous a procedure, that it should be abandoned. The same is true of vaginal incision and drainage. Violent attempts at extraction of the child by forceps, version, or craniotomy, should now have only an historic interest. The only possible justification for reposition or incision and drainage, would be an emergency in a remote district, when the other alternative is the death of an undelivered patient. A competent operator should be summoned without delay, to immediately remove a tumor so treated.

There is now no question that the best treatment for an ovarian tumor obstructing the birth canal during labor, is abdominal ovariotomy. The important question is, shall the operation routinely be proceded or followed by Cesarean section? Successful cases have been recorded, in which, after removal of the tumor, preferably toward the end of the first stage of labor, the patient has been delivered by forceps before or after closing the abdomen. That plan, in view of the excellent results of elective Cesarean section, subjects mother and child, in clean cases, to ordeals and risks that seem unwarranted. In all clean cases, I would at once resort to Cesarean section, and then remove the tumor. Indeed, this course is technically necessary in some impacted and broad ligament growths. The fact of the matter is, that operations for ovarian tumors blocking the pelvis during labor, are usually cases suspected of infection by reason of late diagnosis and frequent vaginal manipulations. From the standpoint of Cesarean section, they then, are not elective cases, and the danger of the classic section is a real one. If infection of the uterus, or of the tumor is assured by clinical signs and a history of long labor and repeated examinations, or of attempts at reposition or delivery, supravaginal hysterectomy with extraperitoneal treatment of the uterine stump in the lower angle of the abdominal incision, is the operation of choice. When a densely adherent, suppurating tumor has been enucleated from Douglas' pouch culdesac drainage is also indicated.

For the "suspect cases" (a phrase in major obstetric surgery that mocks our practical knowledge of infection, and sometimes leads astray one's surgical judgment), for the doubtful cases of uterine infection, after removing the tumor through the abdomen, an extraperitoneal method of delivery of the child, would seem desirable. There are three such methods for consideration:

(*a*) The ovariotomy having been delayed until the cervix is dilated, forceps or version is employed to deliver the child after or before closing the abdomen. The danger of hemorrhage from the tumor pedicle accompanying or following such manipulations, can be successfully safeguarded by avoiding mass ligatures and careful closure of the stump by suture. (*b*) If delay in operating until the cervix is open, is contraindicated, after removing the tumor, manual dilatation could precede forceps delivery, or a rigid, uneffaced primiparous cervix would indicate vaginal Cesarean section in order to secure an extraperitoneal delivery. I have no doubt there are those so enthusiastic over vaginal Cesarean section, as to gladly give it a place in this particular class of cases. (*c*) Finally, extraperitoneal suprapubic Cesarean section by one of the more recent transperitoneal or essentially, extraperitoneal routes, might find advocates among those convinced of its value in "suspect" cases.

For tumors blocking the pelvis during labor, my obstetric and surgical judgment at this particular time would induce me to always begin with eventration of the uterus and the classic Cesarean section, and then remove the tumor with every precaution against its rupture and contamination of the operative field. If in doubt of the patient's life from infection of her uterus, supravaginal hysterectomy would follow, with extraperitoneal treatment of the cervical stump in the abdominal incision.

Ovariotomy in the Puerperium.—There can be little difference of opinion as to the treatment of an ovarian tumor in the puerperium. As stated above, the traumatism incident to labor, increases the risk of necrosis and infection, and the frequency of torsion of the pedicle is increased threefold. The early recognition of any of these accidents, is most important. Any rise of temperature, tenderness, pain or pressure symptoms, associated with a tumor, are sufficient to warrant immediate operation. So long as there are no such symptoms in the early puerperium, the tumor may be removed at the patient's convenience, provided she has been given full knowledge of its presence and its dangers, and of the trivial risk of its removal at any period of her convalescence.

In conclusion, let me offer for your discussion the following topics:

1. Shall all ovarian neoplasms, regardless of location and character always, and at any period of pregnancy, be removed?

2. Operating after fetal viability, should Cesarean section be routine or exceptional?

3. During labor, should tumors offering mechanical obstacle ever be treated by attempts at reposition, by vaginal ovariotomy, or by incision and drainage?

4. Under what circumstances, after removal of the tumor through the abdomen, should vaginal replace Cesarean delivery, and when is hysterectomy indicated?

5. Has vaginal Cesarean, or extraperitoneal suprapubic Cesarean section any place in the treatment of cases in which infection of the uterus is suspected?

6. How soon after delivery should an ovarian tumor be removed, when pregnancy and labor have been successfully passed?

SUMMARY OF CASES.

CASE I.—*Suppurating Dermoid Complicating Labor.*

Mrs. F. Germantown. Consultation with Dr. George F. Cameron. Primipara. Aet. twenty-eight. Labor began at 9 P. M. Twelve hours later, temperature 101° F.; pulse 126. Cervix not dilated. Pelvis blocked with a densely adherent tumor completely filling the pelvic cavity. The cervix was not within reach of the examining finger. There had been no attempts at reposition of the tumor or delivery of the fetus. I saw the patient at this time, and operated at once at her home. The tumor, a suppurating ruptured dermoid, could not be removed until the child had been delivered by Cesarean section. Hysterectomy, Drainage. The peritonitis that was present at the time of operation, progressed rapidly, and death occurred in forty-eight hours. The infant survived, and is now ten years old.

CASE II.—*Double Ovarian Cystomata.—Adherent and Necrotic. Multiple Uterine Fibromata. Acute Symptoms at the Fifth Month of Pregnancy.*

Mrs. H. Consultation with Dr. Alfred Stengel. Operation at University Hospital. Subacute abdominal symptoms—pain, tenderness, pulse 99, temperature 100. The patient's religious faith exacted a promise not to remove the fetus and uterus. The densely adherent and necrotic cysts of both ovaries were removed. The larger one, the size of a cocoanut, contained about ten ounces of chocolate-colored, foul-smelling fluid. Seven subserous and interstitial fibroids were noted in the uterine wall, one of which was adherent to the cyst, and was evidently infected. The operative field and the fibromatous uterus indicated hysterectomy, which had been interdicted by the patient and her husband. It was necessary to place a condom drain to the depths of the pelvis and adjacent to the suspicious fibroid. This precaution saved the patient's life. Miscarriage occurred on the third day. A stormy convalescence followed, two small necrotic fibroids being discharged through the drainage tract before it closed.

CASE III.—*Dermoid with Twisted Pedicle Simulating Appendicitis at the Seventh Month of Pregnancy.*

Mrs. F. Para-i. Admitted to the Methodist Hospital, Feb. 21, 1910, for operation for a presumed third attack of appendicitis within six weeks. Seven months pregnant; patient seen with Dr. J. M. Spellisy, and transferred to the gynecological ward.

I removed a necrotic dermoid with twisted pedicle. The tumor, the size of a large orange, was slightly adherent, and situated in the right iliac fossa. The adjacent appendix was also removed. No drainage. Pregnancy was not interrupted, and the patient was discharged well at the end of two weeks.

CASE IV.—*Simple Cyst First Discovered in the Puerperium.*

Mrs. F. Preston Retreat, Case No. 6190. Para-i. Labor and puerperium, normal. On the fourteenth day, when the routine pelvic examination before discharge from the hospital was made, an abdominal ovarian cyst, the size of a cocoanut, was first discovered. It was removed two days later—a simple monocyst. Convalescence normal.

CASE V.—*Abortion and Suppurating Dermoid.*

Mrs. B. Aet. twenty-two. Para-i. Admitted to the Methodist Hospital, Oct. 7, 1908. Had been ill since a miscarriage in the second month of pregnancy, two weeks prior to admission. Temperature 101° F.; pulse 106. A suppurating, densely adherent (left) ovarian dermoid was removed. The uterus and remaining tube and ovary being seriously infected, hysterectomy with drainage through the culdesac was done. Recovery.

CASE IV is the only case of ovarian cyst associated with labor and the puerperium, at the Preston Retreat, in the last 3300 cases.

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500 NORTH TWENTIETH STREET.

FIBROID TUMORS COMPLICATING PREGNANCY AND LABOR.*

BY

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History.—Prior to the appearance of Levret's work, in 1749, there had appeared mention only of isolated cases of labor complicated by uterine tumors. The first record of what appears as a fibroid associated with pregnancy is one of the illustrative cases of Hippocrates' Fifth Book of Epidemics, according to Lefour, and is cited as follows: Forty days after labor the patient spontaneously expelled a fleshy tumor. The abdomen again became flat and the flatus disappeared. The discharges and the fetid blood ceased. The woman recovered. The Father of Medicine regarded this as an instance of superfetation.*

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*Read at the joint meeting of the Obstetrical Society of Philadelphia and the Chicago Gynecological Society, Philadelphia, May 9, 1913.

Corradi, in his history of obstetrics, refers to the first observation directly of interest to the obstetrician. He reports how, in 1530, Berenger de Carpi, together with Leon de Laenga, saw a woman in labor who died from the complications of a large fibroid tumor. In 1646 Fabrice de Hilden records an observation in which a fibroid of the cervix was mistaken for a fetus, since it presented in advance of the head and blocked the labor, which lasted six days and was terminated by rupture of the uterus. The autopsy showed that the child's head had passed through into the abdomen. Paullinus, in 1686, cites the case of a woman who remained in labor during three days. Believing that the tumor was another child, they exerted traction upon it. The patient died the next day and at the autopsy it was disclosed that in the orifice of the cervix there was a fibroid tumor the size of a fetal head. In 1715, Amand refers to a fibroid tumor which was mistaken for the head of a child, and effectually prevented birth. Louis writes, in 1748, that sterility is a necessary sequence of a fibrous body in the uterus.

The work of Levret is chiefly remarkable for his careful anatomical pathological descriptions of the tumors which antedates the more widely known work of Morgagni and Hunter. Levret concerned himself with the treatment of the palpable tumors of the cervix and those which project from the uterine cavity as polyps, since only these forms were regarded as open to treatment. He suggests that in case the fibroid is not expelled spontaneously, that its pedicle should be ligated. Simon was the first to advocate the Cesarean operation, in 1743, as a method of treatment, and in 1791, Vincenzo Michelacci removed a tumor from the uterine orifice, after which a living child was extracted with instruments.

Following the discussion of premature labor, in 1756, in London, Macauley and Kelly treated several cases by abortion, in spite of the criticism of Baudelocque and his pupils. Ashwell, after describing the putrid degeneration which often supervenes in fibroids, suggested in 1836, that the induction of labor would prevent such complications, which suggestion was vigorously combated by Ingleby, in the same year. The whole subject of fibroids and pregnancy furnished a theme of discussion for the Société de Chirurgie in Paris, in 1868 and 1869, since when it has been a favorite topic.

Frequency.—The relative frequency of fibroids during pregnancy naturally depends upon its frequency during the child-bearing age, and the relation between fibroids and sterility. There is little doubt but that fibroids of size sufficient to complicate labor are apt to disturb the circulation of the uterus and thus delay the menopause. A very considerable proportion of pregnancies complicated by fibroids are consequently more than forty years of age; thus, fourteen of Hofmeier's forty-two cases were forty years or more; while twenty-three of the same series were more than thirty-five. Seventy-five per cent. of Schauta's patients were over thirty years when pregnancy first occurred, while 46 per cent. of Pinard's series of 171 cases were more than thirty years. Accuracy, therefore, demands that we adduce statistics showing the frequency of fibroids in women under forty-five years. Unfortunately, I have met with no series in the literature thus considered.

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*My translation from Lefour.

The statistics of Young and Williams come the nearest to it, and approximate the frequency of small fibroids in women under thirty-five years of age. These authors found small fibroids recognized only after the abdomen was opened at operation in 2 3/4 per cent. of 1402 cases in Boston. Since this series includes no case diagnosed previous to operation, the percentages are lower than the actual facts. The text of these authors is somewhat obscure on the following point, yet it appears from the context that they also noted fibroids in 7 1/8 per cent. of 363 women under thirty-five years, autopsied at the Boston City Hospital. The frequency of fibroids in gynecological clinics cannot be adduced as value here save in a general way, since we would limit out study to the frequency of fibroids in women between sixteen and forty-nine years. The larger number of women in a gynecological series who are more than forty-five years of age more than offsets the smaller number younger than the age at which fibroids make their appearance, and modifies in an uncertain way the percentages available in the literature. It is stated that fibroids run between 4 and 8 per cent. of the ordinary gynecological cases. Thus Haultain noted them in 8 per cent. of cases in Edinburgh; Goetze, in 8 per cent. of cases in Greifswald; Doederlein in 8 per cent. of cases in Tübingen; while Hofmeier, Essen-Moeller and Kleinwächter all found averages between 4 and 5 per cent. The percentages of fibroids noted at autopsy are of interest, yet their value in this consideration is impaired by the fact that the majority of these observations are based upon autopsy records of females of all ages. Pichard, in 1813, found fibroids in 1 per cent. of 800 women at autopsy; Pollack, in 1852, in 7 per cent. of 583 postmortem cases; Braune, Chiari and West each noted 1 per cent. Champney found fibroids in 8 per cent. of 1860 women over thirty in autopsy records at St. Bartholomew's Hospital, while the much quoted statistics of Bayle, in 1813, state that one-fifth of all women over thirty-five years were found to have fibroids. Bayle's statement is as follows: "car en faisant l'ouverture du cadavre de cent femmes prises indistinctement et agees de plus de trente-cinque ans, il est au moins vingt chez lesquelles on trouve un ou plusiers de ces corps accidentels." We emphasize these older statistics as more nearly representing the true frequency of fibroids, since at the present time large growths are usually removed during life by the surgeon.

The literature indicates that fibroids associated with pregnancy are not uncommon. Mann states that in the five years prior to his paper in 1907, more than seventy authors had reported cases. Carstens, in his review of the literature to January 1, 1908, tabulated 516 cases, of which 498 were subjected to various abdominal operations. Yet only 117 of these were at full term, and 381 less than seven months. The frequency of this condition in obstetrical clinics, as shown by statistics, varies within wide limits, doubtless because the most complicated cases alone are apt to be recorded unless the subject has been the theme of special investigation in the clinic. The proportion in various obstetrical clinics ranges between 1–125 and 1–2000 cases. Stratz, in 1886, recorded twenty-five cases from Schroeder's clinics. They were observed among 20,000 obstetric cases. Twelve were operated during pregnancy, and had been reported prior to his paper. Thirteen came into labor and are separately considered. Stolpinsky observed eight fibroids in the series of 14244 obstetrical cases during 1900-1903. Pozzi reports eighty-three cases in 10050 labors during a period of five years. Schauta, eighty-six cases in 110,000 pregnancies in his clinics; Haultain, seven in 4000 pregnancies; Goetze, one in 461 births; and Le Maire, one in 1325. Pinard in 21,891 deliveries in the Baudelocque clinic during 1895–1905 found 171 cases of pregnancy and fibroids. Troell reports fifty-one cases from the obstetrical clinics in Lund to 1910; Siegel, sixteen cases from the Freiburg clinic between 1904 and 1911, while Köhler records ten large fibroids noted in 6000 births in Strassburg between 1901–1911. Yet Mangiagalli encountered pregnancy with fibroids but three times in eighteen years in the obstetrical pavilion in Milan. The infrequency of cases occasioning marked obstetrical complications is emphasized by many observers. Spencer, in an experience of 35,000 labors during fourteen years, found only one case in which extirpation of the myomatous and pregnant uterus was necessary. Basso is quoted by Joubert to have seen but four cases demanding operative procedures during the observation of more than 8000 deliveries during 1894–1903 in Florence. Kerr states that laparotomy was necessary only three times for fibroids in 3500 labor cases in Glasgow. Marchthurn states that operation was necessary in only four myoma cases observed during 24,000 deliveries prior to 1897 in the Chrobak clinic. Boursier quotes Fieux that only twelve fibroids were observed during the delivery of 25,498 cases in the obstetrical departments of Bordeaux between 1870–1900. No abdominal operations were necessary in this series.

Hofmeier mentions sixty cases of pregnancy found in 1000 fibroid cases; Scipiades, seventy-five in 985 cases; Fabricius, fourteen pregnancies encountered among 801 fibroid operations. Peham mentions eight pregnancies encountered in 117 fibroid operations; while Kelly and Cullen in 1674 fibroid operations observed but eleven cases of pregnancy.

Fibroids, however, may coexist with pregnancy without recognition. Thus Troell on the final examination of 5159 puerperal women Lund found fibroids diagnosed for the first time in twenty cases. In the same manner Le Maire found forty fibroids not hitherto diagnosed in 16,850 puerperal women on discharge from the Stockholm clinic. It is probable, however, that fibroids coexist with pregnancy more frequently than these reports would indicate since there are always many cases like those of Troell and Le Maire in which the tumors remain undiagnosed until the examination on discharge.

It is unfortunate that we have few reports of series from America, since judging from the isolated cases reported in discussions at various Society meetings, the coincidence of fibroids and pregnancy or labor is very common in the practice of American surgeons. Save the excellent report of Lobensteine of 100 cases in the New York Lying-In, there are no other American series of size.

Fibroids and Sterility.—There is no doubt but that the fibroid statistics of the literature show higher proportion of sterile marriages than similar cases not presenting such deformity, yet it is an open question whether the fibroids are responsible for the sterility, or merely result because the woman is sterile. Olshausen found sterility in 30 per cent. of 1730 married women in the fibroid cases recorded by West, Roehrig, Beigel, Schumacher, Scanzoni, Michels, Winckel, Schorler, and Hofmeier. In the same manner we have found that sterility existed in 31.5 per cent. of 3617 similar cases, adding to the above series the cases of Schroeder, Young and Williams, Haultain. Goetze, and Kelly and Cullen.

All of the many errors attending any series of sterility cases probably occur in these tables. It appears to me, moreover, that they contain errors from the incorrect translation of some of the earlier series forming the basis of Olshausen's calculations, since there are differences in the figures cited by Hofmeier and Olshausen and Lefour in what appears to me as the same series of the same author. Unfortunately, I have been unable to obtain all of the original reports for verification. That there are errors due to variation in the usage of common terms is certain, since some have accepted as sterile cases which were pregnant but which aborted before reaching term, while others have included these as fertile. Assuming that the proportion of sterility in these 3600 cases is anywhere between 25 and 35 per cent., we see at once that this is more than the sterility of ordinary marriages. The latter proportion is variously given. Peter Mueller's compilation showed that in the series of Sims, Simpson, Wells, and Duncan, the percentages of sterility ran from 8 to 15 per cent. Grünewaldt found sterility in 21 per cent. of 900 cases who complained of symptoms referable to the pelvis, and in whom congenital conditions were deemed sufficient to account for the sterility in all cases. Hofmeier found sterility in 447 of 2795 private patients (17 per cent.), as contrasted with 441 cases noted in 5462 cases at the Policlinic (8.1 per cent.). Young and Williams found sterility in ten and a half per cent. of 238 medical cases, who gave no symptoms referable to the pelvis. These women were of the same average age as their fibroid cases; *i.e.*, 38.4 years. Goetze found sterility in 7 per cent. of 730 gynecologic cases, including those with fibroids.

There is no doubt but that these figures show an overwhelming proportion of sterility in fibroid cases, yet we must agree with Hofmeier in using caution in accepting the sterility as necessarily caused by the fibroid. There are many points for consideration. Fibroids are more frequent in the fifth decade of life, while pregnancy is most common in the third, a difference of twenty years. There is ample opportunity during this long period for other conditions to occur which will cause sterility. In fact it appears as if in the majority of cases the sterility is the cause of the myoma rather than that the myoma is the cause of the sterility. Other causes beyond the fibroid may be operative in the causation of sterility. Women are often sterile from design. Moreover, tubal and ovarian disease are frequently observed associated with fibroids. Thus Kelly and Cullen found that the tubes were bound down with adhesions in 364 of their 934 cases, while one tube was affected in fifty-nine other cases. The ovaries also showed some departure from normal in more than half the cases of the entire series (496 of 934 cases). Young and Williams likewise found inflammatory change in the appendages of thirty-five of their 163 cases operated for fibroids. Whether the tumor is the cause of these complications in any marked per cent. of cases is impossible to say. There is no doubt but that the fibroid occasionally may cause adhesions through friction, pressure of the tube, and the inflammation following degeneration. Yet venereal infection cannot always be excluded. Young and Williams investigated the histories of thirty-one married women with inflammatory lesions in the appendages. Ten of these were sterile while twenty-one had born children, percentages closely approximating those of the fibroid cases with normal adnexa.

Martin, at the International Congress in Buda Pesth, called attention to the fact that more than 50 per cent. of sterility is due to the husband, and also made a strong point of the ovarian condition as another causal factor of sterility with fibroids. Yet we must not in this discussion forget that in the twenty years which intervene between the period of most frequent childbearing and the height of tumor growth, a woman may bear children, and later develop a fibroid which may or may not cause subsequent sterility.

The site of the fibroid is of great importance in this consideration. In view of our present knowledge of the fibroid uterus, it seems difficult to believe that all myoma were once regarded as equivalent in the causation of sterility. The recent work of Sampson has given us anatomical proof of conditions long suspected from clinical observations, *i.e.*, that the influence of the tumor upon the circulation of the uterus, and *vice versa*, depends upon its location and size. Many authors have discussed the site of the tumors from the stand-point of sterility. Their statistics, however, have not confirmed our expectations.

Hofmeier, in forty-two cases of fibroids and pregnancy, located the growth as interstitial in thirty cases, subserous in five cases, submucous in two, and cervical in two cases. Schorler, in 253 cases, found sterility in nine per cent. of cases with fibroid polyps, 16.7 per cent. of cervical, 24.7 per cent. of interstitial, 38.8 per cent. of submucous, and 47.8 per cent. of subserous growths. Young and Williams, in their series, found that sterility was present in 27 per cent. of the cases with interstitial tumors, 31 per cent. of the submucous cases, and 42 per cent. in the subserous cases. Their series arranged in another manner showed that the size and number of the growths was quite as important as the location. Goetze arranged his cases in four groups, according to the size and number of the tumors and the severity of the symptoms. The sterility given as associated with these groupings ranged from 13.6 per cent. for the simpler tumors (less than the size of an apple) to 50 per cent. with growths the size of a man's head or larger. This table is of interest in reminding us that the high proportion of sterility in other series may be explained by the fact that the largest growths are often interstitial, and that pregnancy is less likely with the largest growths. Goetze also emphasizes that 91 per cent. of his fibroid cases with submucous growths had borne children, and calls attention to the rarity with which this form of tumor is seen in nullipara.

Nearly all authors unite in stating that "one child" or relative sterility is also commonly observed in fibroid cases. Of sixty-eight cases reported by Pinard thirty had not been pregnant for more than ten years.

The Effect of Pregnancy on the Tumor.—The tumor increases rapidly in size during pregnancy, frequently attaining the size of years' ordinary growth in three or four months (Caseaux). Cases are reported where a tumor the size of a hen's egg grew to that of a four months' pregnancy prior to the conclusion of the period of gestation. This increase in size is partly due to actual growth resulting from the stimulation of the muscle fibers by the increased vascularity and the influence of pregnancy, and partially due to edema. The actual growth, as shown by Mallory, is due to the proliferation and hyperplasia of muscle cells, while the fibrous elements remain merely as supporting structures. Edema exerts a marked influence upon the consistence of the tumor. Occasionally the growth attains enormous size from edema alone. Interstitial and submucous tumors are most apt to be thus affected. Polyps are often reported which, having outgrown the space available in the uterus, are forced into the cervix, without inducing labor. All emphasize the softness of the rapidly growing tumor, which Tarnier claims may undergo rhythmic contractions. The pelvic blood-vessels may attain tremendous size. As a result of this increased blood supply, the uterus usually presents a dark purplish-red color. Bleeding may continue during pregnancy, especially with submucous growths. Nauss observed it nineteen times in his series.

As the uterus rises out of the pelvis, the tumors attached to it usually become displaced above the pelvic brim. Even the growths which have developed in the lower segment become drawn up during pregnancy or labor. This fact has determined the expectant method of treatment, a method which unfortunately is not known to all who practice surgery. Cervical and intraligamentous growths are not usually displaced, unless they are driven downward during labor, sometimes in advance of the head, when they may be forced out of the canal, while more frequently they remain as an obstacle to delivery. With the softening of the tumor mass there follows alteration in form—a point emphasized by Olshausen. As the uterus enlarges and rises up the fibroids lose their globular form, or become flattened as the uterus expands—a fact especially true in the growths of the corpus, which on this account are difficult to diagnose. I once mistook a large fundal tumor for a fetal head, the large size of the patient (who was in labor) adding to the difficulty of the diagnosis.

In the great majority of cases there will be no symptoms due to the tumor during pregnancy. When symptoms are encountered those of pressure are most common, and the bladder, ureter, bowel, and pelvic blood-vessels may be more or less obstructed. Cases have been recorded of intestinal obstruction initiated by pressure of the tumor. Occasionally symptoms arise from the overdistention of the abdomen and the pressure upon the diaphragm from the large tumor mass in the latter months of pregnancy. As a rule, intraligamentous growths are the most common source of pressure. Various degenerations may occur during pregnancy. Virchow describes cyst formation with and without hemorrhage. Tarnier and Mackenrodt called attention to necrosis, and Troell has collected twenty-three instances. Kaltenbach described red degeneration, a subject which has recently been emphasized by Bland-Sutton as the frequent cause of pain. Torsion of the pedicle may also occur, the twist involving only the tumor proper; or sometimes the womb itself. Piquand and Lemeland have collected twenty-five such cases from the literature, twelve of one and thirteen of the other. As a result of the torsion, various degenerations may be seen ranging from simple edema to necrosis and gangrene, with subsequent peritonitis.

Effect of the Tumor upon Pregnancy. Abortion.—The majority of authors quote Gusserow to the effect that abortion occurs in 21 per cent. of cases. Pozzi, however, at the International Congress of 1909, voiced the belief that 5 or 6 per cent. more nearly represented the true proportion. These figures seem lower to us than are indicated in the literature. It is certain, however, that Gusserow's tables contain many errors, some of which we will show, in order to prove our claim that the true percentage represented there is less than the figures quoted. A constant difficulty encountered in the study of the older cases is due to the lack of data given in the reports so that it may be impossible for a reviewer to say whether abortion followed spontaneously or resulted from operative measures directed toward the removal of the tumor. Gusserow's tables apparently were copied from the following series in Lefour, and read as follows:

	Cases	Aborted
West	36	28
Winckel	46	16
Sebileau	47	15
Nauss	241	47
Toloczinow	119	21
Lefour	307	39

The reference of West is not easily verified. The quotation given does not contain the figures quoted, but presents data only of interest in the study of fertility. It states that sixty-two married women with fibroids had 124 children and forty-eight abortions. Hofmeier states that the Winckel article reads: "Of my forty-six patients, thirty-seven had 114 children at term, and sixteen abortions." The exclusion of these faulty series considerably diminishes the percentage of abortion in the total of the remaining series. Lefour, quoted above for 307 cases, distinctly states in his article that "of my 307 cases, 227 only made reference to the time at which labor terminated." Abortion occurred in thirty nine of these (17.1 per cent.). These references all antedate 1880.

Later Series Give Lower Percentages.—Chahbazian, 1882, reports that abortion occurred in eight of seventy-three collected cases of cervical fibroids and pregnancy (10 per cent.). Further study of his article shows, however, that operative interference for the removal of the tumor during pregnancy was carried out in eight cases, with two resulting abortions. His percentages, therefore, should be reduced to 8.2 per cent. Hofmeier reports twenty-three cases, two of which are excluded on account of hysterectomy during early pregnancy, and one aborted because of a hydatiform mole. Two of the remaining twenty cases miscarried (10 per cent.). (The calculation is my own, as Hofmeier's article states that seventeen cases remained after the deduction of the two abortions, evidently a typographical error.) Stratz reports twenty-five cases from

Schroeder's service, seven of which must be deducted as aborting following operative procedures. Abortion resulted in three of the remaining eighteen cases (16.6 per cent.). Goerdes reports nine cases from Martin's clinic, all of which went to term. Meheut, 1902, records five abortions in the eighty-four cases observed in the Clinic Baudelocque (6 per cent.). Le Maire reported only two abortions in 121 cases. Lobenstein, 1911, reports thirteen spontaneous abortions in his series of 100 cases (13 per cent.), and two following operations. Ten of Troell's fifty-one cases aborted, as did ten of Schauta's first series of fifty-four cases up to 1898.

Unfortunately, the tendency is for abortions to occur late in pregnancy. Thus Lefour records that twenty-six of thirty-two cases aborted later than the second month, and seven cases between six and seven months. Since the time of Forget, in 1846, authors have sought to correlate abortion and the site of tumors, often without success. Pinto's work is of interest in this connection. As a result of his study of five early pregnancies removed by hysterectomy he concluded that abortion is not likely unless the ovum is imbedded in the thinned decidua immediately overlying the tumor. Premature labor occurs in about the same percentage as abortions. Lefour mentions this termination in twenty-three of 227 cases (10 per cent.), and Chahbazian, in ten of seventy-three cases of his collected cases of fibroid of the cervix (13.8 per cent.). Yet it is quite likely that labor may here have been induced in some of these cases as a therapeutic measure. Meheut, in Pinard's series, records premature labor in thirteen out of eighty-four cases (15.4 per cent.).

On the other hand, the uterus may be extremely tolerant of both fibroids and pregnancy. Twins and triplets, each at term, are recorded. Lefour mentions four cases of full-term twins among his 307 collected cases, although I find that the tumor was so small as to be nearly negligible in two of the cases. In the same manner Carstens mentions three twin pregnancies which went to term after myomectomy. MacClintock's case of triplets was complicated by an interstitial tumor, 7×2 1/2 inches, found in the interior wall of the uterus at autopsy. Carstens cites another case of triplets reported by Jepson, but operated before term.

Occasionally much difficulty is encountered in removing placental tissue postabortum, on account of fibroids blocking the way. Not only may dilatation of the cervix be extremely difficult, but the uterine cavity may be divided into two compartments by a fibroid jutting out from the wall, which may prevent further exploration until its removal.

Fetal Position.—The tumors frequently affect the position of the child, and breech and transverse positions are common. Thus vertex presentations constituted 59 per cent. of 304 cases which I have compiled from the literature, in contrast with 22 per cent. of breech and 18 per cent. of shoulder presentations. Yet considerable variation is shown in the various reports. Thus the vertex cases range from a minimum of 51.9 per cent. (Lefour) to a maximum of 76.4 per cent. (Lobenstein); breech from 7 per cent. (Lobenstein), with the next lowest of 20.8 per cent. in Toloczinow's series to 32.3 per cent. (Lefour). The transverse presentations maintained a more even proportion, as is shown by the following: Lobenstein, 16.4 per cent.; Lefour, 16.6 per cent.; Süsserott, 17.6 per cent.; Toloczinow, 20.8 per cent.; and Nauss 20.9 per cent. Yet faulty presentations occurred in only four of Schauta's fifty-four cases, *i.e.*, three breech and one brow presentation.

Placenta Previa and Ectopic Pregnancy.—Placenta previa has been described so frequently that a fibroid uterus must be considered as a strong predisposing factor. At the first meeting of the American Gynecological Society in 1876, Chadwick reported one personal observation, together with eight others collected from the literature. The frequency with which this anomaly occurs during pregnancy with fibroids has been studied by Nauss and Lefour, the former finding it in 2 per cent. (five times in 221 cases), while the latter records it in 4.2 per cent. (13 of 307 cases). Ectopic pregnancy is also often reported and its frequency has been emphasized by Noble. Troell records forty-nine cases from the literature.

Labor.—Fibroids of the corpus with the exception of some intraligamentous growths rarely block the pelvic outlet at term to cause distocia. More frequently they merely diminish the strength of the uterine contractions in labor, and cause inertia. Pressure symptoms frequently arise, but are seldom serious. Occasionally the prolapse of a pedunuclated subserous growth effectually blocks labor, yet it is remarkable how seldom the obstruction is effectual. Even the tumors of the lower segment may be drawn above the child's head during labor, long after the hope of such good fortune had been abandoned. Cervical fibroids are the usual cause of dystocia from impaction, especially when situated on the posterior wall, yet the presence of such tumors does not demand even difficult birth. All depends upon the size of the tumor, its consistence, and whether it is movable or immovable. Thus, Chahbazian, in eighty collected cases of pregnancy with cervical fibroids, found that "easy" spontaneous labor ensued in thirteen cases, while in ten other instances labor was finally spontaneously accomplished, but after many days. Yet, as I reviewed his series of "easy" labors, I was forced to disagree with his idea of "easy" in several of his cases. There is no doubt that supravaginal cervical fibroids are the most uniform source of dystocia, since from their immobility they are likely to remain in the pelvis. The uterus may rupture as a result of blocked labor. Troell has collected nineteen instances. The placenta may be retained and is often adherent and most difficult to remove, if the passage is blocked by tumors displaced from their original position in the rearrangement of the uterine musculature following birth. Yet the most frequent complication is doubtless postpartum hemorrhage, because retraction and contraction, and efficient thrombosis of vessels is impeded by the tumors of the uterine wall. Hemorrhage may closely follow birth, or come many hours later. It tends to recur and constantly threatens, the paulo postpartum hemorrhage of Barnes. This has occasioned many fatalities, and often after all danger was thought to have passed.

Puerperium.—The view that with the completion of labor pass the chief complications from fibroids has suffered many modifications. Recent observations are demonstrating that the puerperium may be the period of greatest danger, especially in uteri with multiple tumors. Many simple tumors involute with the uterus, especially if they are true myoma. They shortly approach the fibroid stage, as shown by Anspach, and Allen and Corson. Thus I once observed a fundal growth the size of a fetal head recede in three months to walnut size, and Doran has collected thirteen cases in which the tumor disappeared in childbed. Downer, among others, has reported the disappearance of a tumor of similar size which, moreover, had not reappeared at the fifth month of a subsequent pregnancy the following year. Yet all cases do not terminate so fortunately since involution is often retarded and complicated by infection. A few years ago I saw a case in which the physician noted a large uterus immediately after delivery of the child. Suspecting twins, he introduced his hand into the uterus to effect delivery. The enlargement proved to be a fibroid in the right fundal wall, the size of a fetal head. Infection followed and the right femoral vein became thrombosed. Three months later the tumor appeared undiminished in size, with a uterus as of a two weeks' puerperium. At operation the growth was found to present areas of beginning necrosis.

Uteri which are the seat of multiple fibroid growths commonly present complications during the puerperium. Edema of the uterus is so common as to be the rule. Submucous growths tend to degeneration and infection. Interstitial growths are often forced from their bed during the changes in the uterine musculature following labor, and present as submucous polyps which commonly become infected. Inversion of the uterus and submucous tumors of the fundus are well-known complications. Fibroid uteri tend to involute in retroversion.

Diagnosis.—Even the most cursory review of the literature emphasizes the frequent difficulty of the diagnosis during the first half of pregnancy. There is no doubt but that a large percentage of cases of the literature presented as cases of fibroids complicating pregnancy were first recognized only after the tumor had been removed and opened. The failure of early diagnosis is often due to the fact that pregnancy is not suspected on account of bleeding, especially marked at the time of the periods, which is especially common in cases complicated by cervical fibroids. Confusion also exists because there are many symptoms which are common to both pregnancy and fibroids, such as breast changes, the bluish discoloration of the vagina and the uterine souffle. The one sign strongly suggestive of pregnancy in the early months is enlargement and softening of the tumor mass, yet these features are commonly taken as evidence of sarcomatous change. In case of doubt, therefore, any rapidly growing tumor must be considered suspicious of pregnancy, just as normally the enlargement of the uterus suggests pregnancy. It *may* be that the test of Abderhalden will prove of value in such cases, *provided* that the irregularities demonstrated by Williams and Pearce for this reaction can be excluded. Within the last week I have used this test in connection with the following case:

A woman of forty-two, married twenty-three years, never pregnant save two years before, when she aborted at the second month. On examination we found a retroposed soft uterus of the size of a two months' pregnancy, surmounted by fibroids which changed the outline and made diagnosis extremely difficult. There was one fibroid in the posterior fundal wall the size of an egg. The uterus appeared fixed and could not be moved with moderate pressure. There had been no cessation of the periods, yet the mass felt like pregnancy. The serum test was positive.

Usually the larger and more numerous the fibroids, the longer it will be before the diagnosis of pregnancy is made. Occasionally, as in the case of Olshausen, the condition may defy recognition for a considerable time. Yet the diagnosis eventually may be given by the test of time and by the x-ray prior to the hearing of the fetal heart. There frequently remains, however, the uncertainty as to the character of the tumor. Bland-Sutton well calls attention to the fact that the surgeon may begin an operation under the impression that he is dealing with an ovarian tumor, yet the mass may prove to be a fibroid, a tumor of the pelvic wall, a misplaced spleen, a kidney in the hollow of the sacrum, a tubal pregnancy, a sequestered extrauterine fetus (Lithopedion), or a calcified cyst. In this connection I recall an interesting case of confusion in the diagnosis.

A woman of thirty-five had had one child fifteen years previously, with no other pregnancy. Her last period was six weeks before we first saw her, since when she had bled at intervals. Marked nausea for one month. Bimanual examination was extremely difficult on account of a thick panniculus. A soft cystic mass was felt in the region of the right cornua. This was about the size of a golf ball and seemed to lie just above and without a fibroid the size of a walnut, situated on the anterior upper lateral wall. The right ovary was in place. The uterus felt extremely broad. There was no evidence of Hegar's sign. The cervix appeared normal on inspection. There were no abnormalities in the vagina. A few smaller fibroids were indistinctly felt in the uterine body. The case was regarded as an extrauterine, yet at operation a pregnancy in the right side of a uterus subseptus was found. The uterine wall was fairly studded with small fibroids, while the cystic mass was proven to be an edematous fibroid.

Sometimes errors are made with the uterus in one's very hand. Thus no less an experienced surgeon than Olshausen removed a gravid uterus, believing it was a cystic fibroid. It proved to be a large sacral teratoma growing from the fetus.

Treatment.—We must keep in mind during any consideration of treatment that the great majority of fibroids associated with pregnancy are seen in elderly primiparal; that the literature clearly shows that pregnancy and fibroids usually run a normal course; that complications during labor and due to the presence of the tumor are usually noted only in such cases as present fibroids in advance of the fetal head at time of labor; and that complications during the puerperium are quite as frequent as those of labor. Yet even the most casual review of the literature strongly suggests that these facts are not known to the mass of men who practice surgery, or else are disregarded, since radical treatment during pregnancy has been the rule in cases which have been reported.

The literature clearly shows that hysterectomy has been the most common method of treatment of fibroids during pregnancy. This is demonstrated by the study of Carstens' 516 collected cases. Thus 23.5 per cent. of his series were operated by Cesarean at or about term; 30.1 per cent. had myomectomy early in pregnancy, while hysterectomy was done prior to fetal viability in 46.4 per cent. That is to say, nearly one-half of the cases of the literature up to four years ago were treated as fibroids alone. The question naturally arises whether the indication for operation in these 204 cases was furnished by actual complications during pregnancy, or whether the fibroid was of size sufficient to warrant the termination of what in many instances was the patient's sole chance for offspring.

It is, of course, possible that the great majority of these cases were treated expectantly and operated only after the advent of symptoms. Yet a review of the literature does not offer much confirmation. Troell, indeed, states that in 100 collected cases myomectomy was done in fifty-seven cases without good indications. There is little doubt that the literature contains large numbers of cases reported as fibroids complicating pregnancy, when in fact there were no complications and the symptoms were merely those of early pregnancy, or else the diagnosis of pregnancy was not made until after the removal of the tumor. Unfortunately, we have no series to show the proportion of cases in which interference was actually necessary during pregnancy. Four only of Pinard's eighty-four cases were operated during this period, while myomectomy was twice performed in Lobenstein's series of 100 cases. Three of Troell's fifty-one cases were also operated during pregnancy. All careful studies emphasize the fact that pregnancy and fibroids usually run a normal course.

A study of the cases tabulated by Lefour, Chahbazian, Turner, Stavely and Thumin conclusively shows that extremely large growths are not the rule among these fibroid series. The largest proportion of tumors of size is shown in Lobenstein's series in which forty-four cases presented fibroids larger than the fetal head at term. Moreover, in thirty-three of his 100 cases there were tumors of the cervix or lower segment, while forty-one were of the posterior wall. It may be urged that the presence of these growths sufficed for operation, but the results obtained in this series by the expectant method controvert such assertions.

It is pertinent, therefore, to inquire as to this inclination for early hysterectomy. It is accidental and due to errors of diagnosis, or merely the natural development of our modern treatment of fibroids; or, because there still exists among the many who operate the belief that the mortality from expectant treatment in general is that of the time of Lefour? Finally, is it the best and safest method of treatment?

In the time of the cases of Lefour, Cesarean section was nearly as fatal in its results as the sentence of death. Twenty-two of the twenty-seven cases of his report died, as did 14 infants; that is, nearly 30 per cent. of the total mortality of his series was from Cesareans, in spite of the fact that these cases constituted less than 9 per cent. of the total cases of the series, *i.e.*, twenty-seven cases in 307. Five of the six Cesareans in Chahbazian's review resulted fatally, with death of four of the six children. Pellanda reports that nearly half (48.5 per cent.) of his collection of 171 fatalities in fibroids and pregnancy were directly due to infection. Indeed, the mortality of all early series resulted from manipulations designed to avoid Cesarean. Fortunately, times have changed, and the fear of this operation has been removed.

The development of modern operative technic has again made possible the expectant treatment, the results of which have given a minimum of maternal and fetal death, provided, always, that operation is performed when indicated. This is well shown by the larger recent series. Thus, in spite of the complications elsewhere enumerated in the series of Lobenstein, reported in 1911, eighty-five cases came to term, and absolutely spontaneous labor ensued in three-quarters of them, a percentage which is increased to eighty-seven if we include deliveries made with low and mid-forceps. The entire series, including eight cases operated during four weeks postpartum, gave a mortality of but 4 per cent. The fetal mortality o the eighty-five cases at or near term is comprised only of six cases, all dead on admission. Pinard's series, 1895–1901, shows equal results. Intervention was necessary during pregnancy in four of his eighty-five cases, and during labor in twenty-four cases. Spontaneous delivery ensued in fifty-four cases. The maternal mortality was 3.6 per cent. for the series; and sixty-five children lived, the other nineteen being less than 2500 grams in weight. Spontaneous delivery ensued in 64 per cent. of Pinard's series of 1901–1904, and in 68 per cent. of Troell's series. With statistics like these in the literature it seems necessary to require indications for operations during pregnancy.

Yet complications may arise demanding operative treatment during pregnancy. For the most part these are due to pressure, hemorrhage or degenerations. When the symptoms arise from impaction, effort should be made to elevate the growth, under anesthesia if necessary. When all simple treatment has failed and operation becomes necessary, what operation is demanded? Myomectomy or hysterectomy? Much depends upon the surgeon and the conditions within the abdomen.

Myomectomy appears to many as a surgical curiosity with a rather narrow field. It is most difficult to perform successfully in the class of cases in which interference is most frequently demanded (pelvic impaction). It is best adapted for pedunculated growths, yet these seldom demand operation, save for pain. It can be best performed in the earlier months before the tremendous increase in the vascularity of the uterus. Yet interference is seldom demanded until the later months of pregnancy. Moreover, adhesions seem to be a necessary accompaniment of any conservative operation requiring the placing of sutures in a vascular pelvis. Infection furthermore is frequent in this class of cases, and the wound is likely to burst open if labor ensues shortly after operation. Nor are all tumors usually removed during myomectomy. Small growths which have escaped removal may later hypertrophy and occasion symptoms by reason of their presence. Finally the reis the ever-present possibility that the scar may rupture during labor in the cases which have been operated by myomectomy but have escaped abortion and have come to term.

Yet, in spite of all theoretical objections, the operation enjoys wide vogue. Tumors of fifteen, sixteen or seventeen pounds have been successfully removed (Netzel's, Schorenz's and Edgar's cases). Many operators have reported its successful employment even where the incision reached nearly to the membranes. Surprisingly few cases are recorded where failure resulted from hemorrhage. Moreover, abortion has been reported in less than one-fifth of cases: thus Turner, 17.5 per cent. aborted in forty-four cases (1890–1900); Thumin, 22.5 per cent. aborted in 102 cases (1885–1900), and Carstens, 14.6 per cent. aborted in 150 cases, to 1908. Again, the maternal mortality is lower than that for hysterectomy in the earlier series, while in the later tables they appear about equal. This is undoubtedly due to the fact that myomectomy usually has been restricted to the most favorable cases. Yet in spite of the results shown by the tables, I believe that the field of myomectomy will be restricted with the diffusion of knowledge concerning fibroids and pregnancy, that is when it becomes generally known that the great majority of such cases can be let alone during pregnancy. The tables are as follows:

	Myomectomy Mortality		Hysterectomy	Maternal Mortality
	Maternal	Fetal		
Turner to 1900, 44 cases.....	9%		37 cases	13.5 %
Thumin, 1885–1901, 102 cases	7.8%	28.4%	89 cases	11.1 %
Le Maire 1892–1901, 93 cases	8.7%	26.4%	67 cases	7.4 %
* Unterberger to 1904, 144 cases	7%		91 cases	10.9 %
Carstens, to 1909, 150 cases..	8.6%	29.1%	204 cases	9.3 %
Troell, 1900–1909, 157 cases..	3.9%	23.9%	133 cases	3 %

When operation is indicated, on the other hand, supravaginal hysterectomy appeals to me as the choice, whenever practical. With the betterment of our knowledge concerning the complications, and the consequent recognition of definite indications for operative treatment, the death rate should be markedly decreased. The operation, however, will always be attended with considerable risk, from the increased chance of thrombosis and embolism, possibly even beyond that indicated by Baldy in the nonpregnant condition.

Fortunately, abortion is no longer considered as a proper method of treatment, for the reason that where indicated it may be impossible of accomplishment, and that in the other cases it merely interrupts the pregnancy, without removing the growth, or diminishing the danger from complications in the placental period. A case of my own is of interest in this connection. A woman of forty-three, mother of six children, while threatening abortion gave evidence of cardiac distress. The uterus was the size of a three months' pregnancy and was studded with multiple fibroids. The heart gave symptoms of myocarditis. We therefore judged the case was not suitable for hysterectomy. Accordingly a small Voorhees bag was introduced with difficulty into the cervix without anesthesia and without stimulating contractions sufficiently to cause expulsion of the bag. Twenty-four hours later we tried a larger bag without result, and on the following day attempted manual dilatation, which, when found impossible, was abandoned for an anterior hysterectomy and removal of the ovum under ether. The uterus was found to be fairly studded with the small fibroids. Following the operation there was constant temperature during the first week and a febrile rise about the tenth day, followed by the extrusion of two fibroid nodules the size of large marbles. One of these was gangrenous and suppurating.

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* The series of Unterberger is composed of Thumins series, together with cases of Olshausen, Abuladse and Unterberger.

†The great majority of the hysterectomies were supravaginal operations.

The treatment of cases at full term naturally varies according to the size and location of the growth. As we have seen, tumors of the cervix, especially of the posterior wall, together with the intraligamentary growths, are most apt to obstruct labor. Yet such cases are rarely encountered. The rarity of cervical growths is well known. Thus, in 2246 cases of fibroids reported by Amann, Bigelow, Sims, Loehlein, Schroeder and Schorler there were only seventy-two cervical fibroids, 3.2 per cent. It is not surprising, therefore, that true obstruction of the pelvis from fibroids during labor is rarely noted. Yet when this complication ensues, and tumors are found firmly impacted in the pelvis, Cesarean section is indicated before there has been much manipulation. It is true that spontaneous birth may occur under almost impossible conditions, yet the chance of necrosis and infection in tumors bruised by manipulation or the trauma of labor is so great that little will be gained by waiting. As in Cesarean in general, the prognosis becomes worse the longer the labor and the more frequent the examinations. When the tumor is small and easily displaceable, labor may or may not be allowed to proceed, according to the individual circumstances. Spontaneous retraction of the growth above the pelvic brim is usual, yet if there are many tumors, others may bulge into the cervix and still offer obstruction, in spite of the elevation of the larger growths into the pelvis. Instances of such complications have been recorded by Cullingworth, Kreutzman and Routh. In general, an early Cesarean in the most threatening cases will save many complications, especially if the tumor mass is of size sufficient to demand a Porro. I am perfectly aware that this method will prevent some spontaneous births, and consequently urge it only for the rare cases presenting tumors in advance of the head at time of labor, and for those in which the uterus is so studded with tumors that ultimate hysterectomy is inevitable. Such treatment enables us to avoid many of the complications of the puerperium elsewhere indicated. The frequency of infection during the puerperium in cases which have been delivered through the natural passages is indicated by the twenty-two cases collected by Berger which showed evidence of gangrene and suppuration, and by six similar cases of Lobenstein and three of Fry. Yet the difficulty of prognosis during pregnancy as to the outcome of actual labor is well shown by my own experience. Four times in my service and that of others have I seen cases during pregnancy which I was certain could be delivered only by Cesarean. Yet labor proceeded so rapidly in three of these that they were unable to reach the hospital before spontaneous delivery, due doubtless to the fact that the tumor became elevated above the pelvic brim subsequent to my examination.

Cases presenting tumors which lie above the pelvic rim should be treated expectantly, provided there is no doubt as to the diagnosis. Dangers from uterine inertia and hemorrhage must be kept in mind, together with the chance of rupture of the uterus in case conditions change and the labor becomes blocked. Nor are such cases free from the possibility of sepsis following trauma of the tumors from labor.

Early interference is advisable in cases presenting multiple growths and infectious processes during the puerperium. The literature is filled with cases illustrating the folly of waiting. As a rule hysterectomy is indicated as soon as the growth is known to be infected.

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920 MONROE BUILDING.

ABDERHALDEN'S TEST OF PREGNANCY.

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INGESTED albumin is acted upon by the digestive juices and split into its component molecules before it is suitable for entrance into the blood stream. If a foreign albumin be injected hypodermatically, protective ferments are elaborated in the blood plasma of the organism, which have the power of digesting this albumin. Schmorl, Weichard and Veit found syncytial elements in the blood during pregnancy, and Abderhalden felt that in case this were true these cell elements could only be removed from the blood stream by the action of the protective ferments which this foreign albumin had caused to be elaborated. Feeling that these ferments were more or less specific, he tested the proteolytic activity of the blood of pregnant individuals to the placental albumin of the same species.

To demonstrate this activity he used the polarimeter and the dialysis method. For the polarization method he prepared a placenta peptone. If serum is added to a clear solution of this peptone and the mixture incubated at body temperature, the presence of digestive ferments will be shown by the occurrence of a change in rotation to light. Observations are taken at intervals during the course of twenty-four hours. By comparing the rotation using nonpregnant and pregnant sera, he established a standard of rotation for each. In the first communications Abderhalden called attention to the difficulties surrounding the optical method, because of the uncertainty of securing a usable peptone even when his directions were carefully followed. He also placed emphasis upon the necessity of a very precise polarization apparatus and experience in its use. Consequently only a few have attempted to put the optical test into use.

The dialysis method is simpler. Albumin cannot pass through the pores of an animal membrane since the individual molecules are too large. If, however, the albumin is broken up by ferment action then the molecules become small enough to pass. If, when albumin and a digestive are dialyzed to water, the split products pass through the membrane and may be demonstrated in the dialysate by suitable reagents.

For dialyzing Abderhalden originally used fish skin condoms, but since these were of varying thickness the results were uncertain and now especial dialysis tubes have been prepared for the purpose. In the original technic the cleavage products were to be tested for by the Biuret reaction, but since the dilution was so great, the reaction was frequently in question. Abderhalden then used triketohydrindenhydrat or "ninhydrin" which gives a distinctly blue color upon boiling with albumin, peptones, polypeptides and amino-acids in extremely dilute solution.

Though Abderhalden has himself continued since the first to get perfect results, he has modified the technic in many of the steps from time to time, probably because of the failures reported by others. He insists upon the importance of every step in the technic, described below, and especially upon the maintenance of asepsis.

Preparation of the Placenta.—A fresh normal placenta is stripped of its cord and membranes and is washed free of all blood. It is then cut into pieces the size of a dime, placed in gauze and washed in running tap water until it is free of pink stain. This may be facilitated by squeezing the placenta in the gauze. Usually this requires from thirty minutes to an hour. Schlimpert and Hendry believe that the best results are obtained when the tap water is not too soft. They relate their ability to secure usable placental substance at Abderhalden's laboratory, but their inability to do so when they returned to Freiburg. They ascribe their difficulty to the fact that the Freiburg tap-water was too soft. They advise in such instances to work and squeeze the placental chunks in 0.9 per cent. sodium chloride solution until there is no question as to the absence of blood.

The blood-free placental fragments are then placed in two liters of boiling water to which has been added two drops of glacial acetic acid. If the placental fragments become brown, or the foam on the water is brown, the placenta has not been sufficiently freed of blood in the preliminary steps. After cooking briskly for one minute the water is poured off, the placental tissue drained and added to another two liters of fresh boiling water and cooked for five minutes.

Some of the water is then filtered through a hard filter paper. To

5 c.c. of the filtrate in a test-tube containing some glass beads is added 1 c.c. of a 1 per cent. solution of ninhydrin. If, upon boiling the mixture for one minute, it becomes blue, or a blue color appears within thirty minutes after boiling, the placenta is not yet free of the reacting substances and should be cooked repeatedly in fresh water until upon performing this test the fluid remains colorless or yellowish. The prepared placenta may be conserved for future use by placing it and some of its water in a sterile, wide-necked bottle, adding a few drops of chloroform and covering with a layer of toluene. We have found empty celloidin bottles very useful for this purpose, since they have wide necks and glass stoppers and are of suitable size. This material is to be kept in an icebox or other cool place and when care to prevent contamination is exercised may be kept usable for months.

When using this preserved placenta a quantity large enough to allow a bit the size of a pea for each test to be performed is removed by sterile tissue forceps and is rinsed under the tap in the grasp of the forceps. It is then placed in five times its volume of water and cooked for five minutes and the water then filtered through a hard filter. To 5 c.c. of the filtrate is added 1 c.c. of 1 per cent. ninhydrin. After a vigorous boiling for one minute and allowing to cool for one-half hour, no blue color should appear; in case the mixture remains clear or is slightly yellowish that placenta can be used for the tests. In case, however, the filtrate gives the blue color, then the boiling and testing is to be repeated until the placenta is freed of the test-giving substances. In order to do away with the possibility of contamination of the placenta conserved in this way, Hendry, after getting the placenta free of substances reacting to ninhydrin, dries and powders the placenta to a fine consistency and uses the powder in the tests. Abderhalden objects to the suggestion and claims that Hendry's contrary results are directly due to this departure in technic.

Dialysis Tubes.—The diffusion shells No. 579A of Schleicher and Schüll, of Düren, Rheinland, are used for the purpose. They may be secured of the chemical supply houses in boxes of twenty-five. These shells should be thin enough to allow cleavage products to pass, yet thick enough to retain albumin. The tubes are placed in sterile water until thoroughly soaked, then sterilized in boiling water.

To determine that the tubes are not too thin, 2 c.c. of serum is added to each tube and according to the further rules to be elaborated the tubes are incubated for twenty-four hours. The surrounding water should not give the test to ninhydrin; only such tubes as do not are usable. To see that the tubes are not too thick 2 c.c. of a 0.1 per cent. Seiden peptone solution is used in the same way. The surrounding fluid in this instance should give the test; such tubes as do not should be discarded.

Reagent.—"Ninhydrin" (Farbwerke vorm. Meister Lucius and Brüning, Hoechst a. M.) may be secured from the chemical houses in this country in phials containing each 0.1 gm. The contents of this bottle added to 10 c.c. of sterile water gives the 1 per cent. solution necessary for the test. This compound is unstable in solution and should be kept in a colored bottle in the ice chest.

Since the quantities of ninhydrin used are 2 c.c. and 1 c.c. the tests may be facilitated by employing a pipette with markings to show these necessary quantities.

Securing the Serum.—Ten or more cubic centimeters are drawn from the median basilic vein either with a Luer syringe or by a specially arranged blood pipette. Since at the height of digestion the blood may contain sufficient dialyzable substances to confuse the test, it has been advised that the blood should be secured before the patient has breakfasted.

Care must be taken that all receptacles which will hold the blood are free of all moisture or substances which might produce hemolysis. Immediately after withdrawal the blood is gently ejected into a sterile centrifuge tube and put away on the ice to clot. If it is not possible to wait until enough serum is extruded, the tubes may be centrifuged at a low rate of speed until the serum floats in sufficient quantity for the test. Spinning at a high rate produces hemolysis. It is difficult always to secure clear serum, but only such serum may be used; if the slightest trace of hemolysis occurs the serum is unfit for the test.

Performance of the Test.—Everything which touches the serum or placenta or the inside of the tubes is to be strictly sterile and the hands of the tester are to be kept clean. A piece of the placental substance, which has been retested, the size of a pea, is placed in the bottom of each dialysis tube. To each tube is then added 1.5 c.c. of the suspected serum. This is transferred from the centrifuge tube to the dialysis shell by means of a long bent pipette such as is used in the Wasserman test or other serum work. Care is exercised that none of the serum touches the outside of the shell. The tube is then rinsed thoroughly under the tap while holding the thumb over the open tube end. The hands should be freely washed that no substances may be left on the outside of the tube to confuse the results. The tube is then placed in its sterile container. (For this purpose we used a nitrogen funnel of about 30 c.c. capacity from which the lead tube had been cut short. Over the cut end we placed a bit of rubber tubing, the lumen of which was kept closed by a simple pinch-cock. This makes a receptacle of suitable size and allows the withdrawal of the liquid later without admixture of toluene. For the purpose of incubating these funnels were placed in ether cans containing a layer of fresh cotton in the bottom.)

Twenty cubic centimeters of sterile water is placed around the tube and a layer of toluene is introduced into both vessels, care being taken not to contaminate either the water or the serum.

The tubes are then placed in a reliable incubator for eighteen to twenty-four hours at 37.5° C. For each test to be made one tube should hold serum alone, another serum plus placenta, another placenta plus 1.5 c.c. of sterile water. The sterile water outside the tubes in every case should stand higher than the level of the fluid in the dialysis shells.

At the end of the incubation period 10 c.c. of the surrounding water is removed to a large test-tube containing some glass beads. Care must be used not to include the toluene. When the funnels are used all the water is to be drawn off first and mixed before the 10 c.c. is taken for the test, since the diffusion does not seem to occur equally throughout the water, the upper part being more thoroughly saturated usually than is the lower part. To the 10 c.c. of water is added 0.2 c.c. of a 1 per cent. solution of ninhydrin and the mixture boiled briskly for one minute and allowed to stand for thirty minutes. If a blue color is obtained the reaction is positive, when negative the solution is colorless or slightly yellowish. In case of doubt, looking through the liquid from above allows one to come to a decision; even faint traces are to be called positive. The test is positive when a reaction is obtained in the tube containing serum and placenta, while the other two tubes fail to react. A reaction in either of the two other tubes show either that they originally contained dialyzable, reacting substances, that the tubes were defective, or that contamination has been introduced, since bacterial action also produces digestion.

When the serum plus placenta tube alone reacts, if the tube is not shown to be defective, and asepsis has been good, it means that the serum has exerted a digesting effect on the placenta, and that the products have passed through the membrane into the water. According to Abderhalden, that serum is from a pregnant patient, otherwise the reaction would be negative, since the serum of a nonpregnant patient is not supposed to have the necessary digestive ferments.

After the test all glassware, as well as the dialysis tubes, are to be thoroughly washed and resterilized, and kept clean until a new test is to be performed. The tubes may be kept in sterile water under a layer of toluene. Each tube may be used for several tests, but from time to time its state of permeability is to be retested.

Abderhalden has performed more than 200 tests, personally, mostly on normal pregnant women. He has reported thirty cases involving differential diagnosis between tubal pregnancy and adnexal swellings. In all cases the biological test agreed with clinical findings, except in one case where, though the dialysis test was positive, a salpingitis was found at operation. In this case dialysis was positive both before and after operation. The patient had missed a period, there was colostrum in the breasts, and the uterus was enlarged. The clinical diagnosis was also ectopic pregnancy. He believes in this instance that the salpingitis may have been subsequent to an infective abortion.

Franz and Jarisch, though using the earlier technic and fish skin condoms, never found the dialysis test in error. They, however, found that chorioepithelioma and cancer of the cervix gave a positive reaction with placenta. Franz, using the now abandoned technic, supported Abderhalden's findings regarding the pregnant patients. He obtained a pregnancy reaction in one case that had a cancer of the cervix.

Schlimpert and Hendry examined 316 cases. They met with a great many difficulties in the first part of this work. In seventy-nine cases they used the latest modified technic. In thirty-nine nonpregnant cases all gave negative tests. The sera of twenty-eight pregnant women all reacted positively, even one who had gone over her period but four days and subsequently presented the clinical diagnosis of pregnancy. Of ten puerperal women, nine reacted positively; eight were in the early puerperium, one in her thirteenth day; the one which reacted negatively had confined four weeks previously.

Lindig had no pregnancy which failed to react, yet does not consider the test specific since he finds that in pregnancy, carcinoma and in other tumors, the reaction occurs with equal distinctness whether placental, carcinomatous, or tumor substance is used in the dialysis tubes. Abderhalden assails his results because he used powdered placenta, and asserts that when the properly prepared placenta is used, reaction is obtained only in case the patient is or has recently been pregnant.

Veit considers the Abderhalden reaction a valuable diagnostic method and relates that on the basis of a negative dialysis test, in a case where pregnancy could not otherwise be eliminated, he operated and enucleated a myoma from the uterus. He has seen positive value in the differential diagnosis of ectopic pregnancy.

Henkel, from an experience in forty cases, had no failure in diagnosis. The serum of an eclamptic failed to digest an eclamptic placenta, however. The reaction was positive in a case which at operation revealed an ectopic pregnancy on one side and an inflammatory tumor of the opposite appendages.

Ekler had constantly negative results in twenty-five nonpregnant individuals while in thirty-seven pregnant women he always obtained the reaction. Most of his pregnancies were in the first week; four were ectopic pregnancies and six were incomplete abortions.

Frank and Heimann, though using fish bladders and the Biuret reaction, never had an error in dialysis, except twice when defective membranes had been used, aside from two cases which reacted positively and were operated as ectopic pregnancy when they had postabortive infection. Later, in an article regarding their experience in the diagnosis of carcinoma they relate that in spite of following the latest technic, in which tissue is rid of reacting substances just prior to the performance of the test, that the sera of carcinomatous subjects react with either carcinomatous or placental substance. Their carcinomatous test-tissue was obtained from carcinoma of the uterus. In sixteen cases of ovarian carcinoma fourteen reacted positively to both placental and carcinomatous tissue, while two were negative. Cancer of the uterus was constantly positive to both test substances. One man who was apparently normal reacted to carcinomatous tissue. In three doubtful cases of carcinoma of the uterus positive reactions were verified by operation. They say that they always get a positive result in pregnancy, though pregnancy will react to carcinoma tissue and carcinoma to placental tissue.

A. Meyer relates that a negative dialysis test was obtained before operation in a clinically positive case of ruptured ectopic pregnancy; while in a clinically questionable case which by operation showed an unruptured pregnancy on one side and a ruptured sac on the other, the Abderhalden reaction was positive. He asks whether the first case failed to furnish enough placenta to produce a reaction, or if the death of the ovum had produced the negative reaction.

Markus using the earlier technic found positive reactions in all of fifteen pregnant and puerperal women and three ectopic pregnancies while eighteen nonpregnant women gave negative results, though five carcinomatous women gave positive reactions to placenta.

Obeying the latest enunciations of Abderhalden he got twenty positives in twenty pregnant women, one of whom was only ten days past her expected period. Eleven carcinomatous individuals were tested to placental tissue; seven were absolutely negative, four faintly positive. Eight carcinoma patients were tested to cancer of the uterus tissue; five gave a positive, while three gave a negative result; these three had carcinoma of the intestinal tract. Of seven pregnancies five reacted negatively to carcinoma tissue and two faintly positive.

Engelhorn tried the dialysis method, using placental substance in 108 cases. Of sixty pregnant patients forty-nine were positive and eleven, who were in the last weeks of pregnancy, were negative. Of forty-eight nonpregnant individuals, thirty-one were positive and seventeen negative. Of twelve pregnant women tested with cancer tissue, ten reacted positively. Of eleven nonpregnant individuals eight were positive and three were negative, though one was a carcinoma patient. With ovarian substance three nonpregnant women reacted positively, while of three pregnant women one was positive and two were negative. With fetal lives he got both positive and negative tests in both pregnant and nonpregnant cases. Engelhorn consequently does not regard the Abderhalden test as of diagnostic importance.

Behne, using placental tissue and the earlier technic with special tubes and ninhydrin examined forty pregnant women in the last few weeks and got positive reactions in all but one. In thirty sick individuals who were not pregnant he found thirteen reactors and seventeen nonreactors. Nearly all who reacted had a suppurating genital condition. Following the most recently elaborated details, he tested sixty sera to placental substance. Among twelve pregnant women, eight gave the test and two, though near term, did not react. Of four ectopic pregnancies controlled by operation three cases were positive and one was negative. Of fifteen infection cases tested at varying periods of from seven days to three and a half months after confinement, thirteen reacted and two failed to react. Of twenty-six women who were not gravid and had not been so for a long time, one-half were positive, one-half negative. Three men suffering from advanced tuberculosis all reached positively.

Freund and Brahm have performed 141 pregnancy tests on 135 patients, on six cases having done two tests each. The optic test was performed 134 times, the dialysis test ninety-nine times. The clinical findings agreed with the optic reaction in the 134 cases but ninety-seven times or 72.4 per cent. and with the ninety-nine dialysis tests but sixty-six times or 66.7 per cent. In ninety-two of the dialysis tests a control optic test was run; agreement occurred in sixty-one instances, in the remainder no harmony existed. They could not notice excessive rotation in their seventeen eclampsia cases. Of three ectopic pregnancies only one reacted positively while of four inflammatory adnexal swellings one reacted positively to dialysis and negatively to the polarization method.

Abderhalden with the optic method relates that in what is now a large experience he has had no failures. He apparently repudiates the joint article of Abderhalden, Freund and Pincussohn, in which numerous failures to get a positive reaction during pregnancy are related, among which are fourteen failures in fourteen patients in the ninth and tenth months of pregnancy.

Williams and Pearce met with great difficulties in the use of the fish skin condoms and with the Biuret reaction, but later with diffusion shells and ninhydrin they got constant positive results in twenty-eight pregnant and eight postpartum cases, one of which latter gave a faintly positive reaction twenty-five days after labor, while the two controls were negative. Using pregnant sera, they found, however, that the serum of pregnancy reacts with tissues other than placenta (kidney, breast, uterus) and with other than human tissues (dog's kidney). Also sera of various sick and healthy individuals gave the reaction with placenta and other tissues. Just as satisfactory results as by dialysis were obtained by mixing tissue and serum in tubes and after incubating for twenty-four hours, testing the filtrate obtained on coagulation by heat and acetic acid with ninhydrin. Inactivation of the serum caused a great diminution in the intensity of the reaction, but did not cause it to disappear. They found that the reaction power may persist in a serum for a week, if properly kept.

McCord, using a dessicated placental powder of his own manufacture and celloidin thimbles as dialyzing tubes, asserts that in 204 tests the findings were in 95 per cent. of cases correct. The 5 per cent. of failures he attributes to errors in technic.

Epstein testing sera to carcinomatous tissue obtained a positive in all but one of thirty-seven cancer patients, while only one of forty-seven cancer-free cases reacted. When placental substance was used only one of eighteen pregnant women gave a negative test.

Rübsamen relates only one error of diagnosis in 100 tests performed on ninety-four cases. In fifty-six cases both the optical and dialysis methods were used. Among thirteen eclamptics the sera of ten digested placenta; while no reaction was obtained in three severe cases. He feels that the method offers a means of making a prognosis. In emaciated subjects he advises that only 1 c.c. of serum be used in the test.

Stange reports that in seventy-eight examinations the test was never in error.

Schiff found agreement between test and clinical diagnosis in all of forty-seven cases which he examined. He tested twelve pregnant women to cancer tissue and all reacted negatively.

Schafer made 123 dialysis examinations sixty-five of which were controlled by polarization. Of sixty-two cases of pregnancy, two failed to react. He had eleven nonpregnant individuals react positively most of whom were carcinoma and fibroid subjects. Of the sixty-five optical tests one positive reaction was given by a uterine fibroid and a negative test was given by a pregnancy. Two pregnancies and two carcinoma cases reacted to both cancer and placental tissue.

In seventy tests Lichtenstein found only one instance where the test did not agree with the clinical diagnosis. In this case a negative test was given by a pregnancy where the ovum had been dead three to four weeks.

Jellinghaus and Losee reported on 563 dialysis tests. They have reported their cases divided into six series according to the technic used. In the last series which nearest conforms to Abderhalden's claims they got 5.5 per cent. of negative reactions in eighty-nine pregnant sera and 8 per cent. of positive reactions in forty-nine nonpregnant sera.

One year ago when Abderhalden still advocated the use of fish skin condoms and the Biuret reaction, feeling that the sources of possible error in the method as then used were too great to yield promising results and thinking that possibly the ferment action of the blood might not be specific to placental albumin one of us began to test the activity of the serum of pregnant and nonpregnant humans to ordinary commercial peptones.

Twenty c.c. of 2 per cent. sterilized aqueous solution of Witte peptone was mixed with 10 c.c. of blood serum in a sterile flask. Of this mixture 10 c.c. was withdrawn immediately and titrated for amino-acids according to the formalin method of Sorensen-Ronchesi. After incubation of the remaining portion for twenty-four hours the titration was again performed. The difference in titer represents in terms of 1/10 normal KOH the increase of amino-acids as the result of digestion.

	Immediately.	24 hrs. later.	Difference.
	c.c.	c.c.	c.c.
Normal pregnancy at term	2.05	3.25	1.2
Normal pregnancy at term	1.85	2.1	1.25
Normal pregnancy at term	1.4	2.1	0.7
Normal pregnancy at term	2.1	2.4	0.3
Normal pregnancy at term	2.0	2.3	0.3
Normal pregnancy at term	1.9	2.7	0.8
Normal pregnancy at term	2.05	2.3	0.25
Normal pregnancy at term	2.0	2.7	0.7
8 1/2 months' pregnancy	2.05	2.3	0.25
Hysteria (menses regular)	2.0	2.7	0.7
Hysteria (menses regular)	2.05	2.7	0.65
30 days after hysterectomy	2.1	2.75	0.65

In four other cases instead of peptone solution placenta was dessicated and powdered and a 1 to 200 suspension was made and tests made in the same manner as already described.

	Immediately.	24 hrs. later.	Difference.
	c.c.	c.c.	c.c.
Pregnant at term	0.9	1.1	0.2
Pregnant at term	1.1	1.1	0.0
Hyperemesis gravidorum third month	1.0	0.95	0.05
Nonpregnant	0.9	0.9	0.0

From the titration experiments with peptone it will be seen that the peptolytic activity of the blood varied in intensity, but that the variation could not be brought into correlation with the gravid or nongravid state of the patient, but depended upon factors not ascertained. From the four cases in which placental suspension was used no proteolytic activity could be demonstrated by an estimation of the amino-acids. If digestion of the placenta occurred it was either not carried to the amino-acid stage, or was not measurable by the method used. The few experiments as performed did not yield promising results so that this part of the work was abandoned.

Abderhalden continued to publish positive results with the dialysis method and when the use of ninhydrin and diffusion shells was advocated we took up the test. We used the dialysis tubes No. 579, 16 mm. in diameter. Seidenpeptone not being procurable, we used wittepeptone and normal horse serum to test our tubes. The tests were performed with the strictest adherence to each new elaboration of the test as discovered by Abderhalden from time to time. Full regard to asepsis was paid and the facilities for work were satisfactory in every way.

By the technic in which the placenta was not reboiled and retested just prior to the test, eleven cases were examined, of whom four were pregnant and seven nonpregnant. Each of the four pregnant women gave a positive reaction. Of the seven nonpregnant individuals only two failed to react. Of the five who reacted positively two were males with syphilis; one woman had been operated one week earlier for tuberculous peritonitis, the uterus and appendages having been removed one year previously; one woman clinically nonpregnant but who had not menstruated for months, suffered from multiple ulcers of the rectum, probably syphilitic.

Since rendering the placenta free of reacting substances before testing, we have tested seventeen individuals. Of five women who were not pregnant, one reacted positively. This patient had periods of amenorrhea from some cause not ascertainable. Of seven pregnant women from all periods, two reacted negatively in the 6th and 14th weeks respectively, who subsequently developed positive signs of pregnancy. The women from the 14th week subsequently gave a second negative test. Of five puerperal women, two who had been delivered thirteen and twenty days prior to the test reacted negatively, the other three women were from the earlier puerperium and reacted positively. The dialysis tubes used in the adverse tests had previously and subsequently given positive reactions. Positive tests occurring when not expected can be explained on the basis of an error in technic, while a negative test is not so easily explained.

A review of the literature and an experience with the test, together with the use of other means of testing the digestive activity of the blood, leads one to question the specificity of the test of Abderhalden; though, since the need of such a reaction is great the test should be further tried, and its results accurately reported.

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PUERPERAL INFECTION.*

A Study of Some of the More Important Features of the Disease with a Review of the Cases treated during the Last Eight Years.

BY
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I. INTRODUCTORY.

I desire to express my appreciation to the Fellows of the Academy for the honor they do me in asking me to address them on this occasion.

To discuss puerperal infection in a short address might seem to be a difficult problem. Puerperal infection, however, has little that is peculiar to itself. An infection in one is much the same as in another part of the body. All wound infections are much alike irrespective of the variety of bacterial invasion.

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* Read by invitation before the New York Academy of Medicine, Section on Gynecology and Obstetrics, May 1, 1913.

II. CLASSIFICATION.

Any attempt to classify puerperal infections complicates the study of the disease and, with our present knowledge of treatment, has little practical value. The pathologic features and treatment are much the same in cases before and at term. A classification based upon the variety of the bacteria involved is scientific, but has little real value at present. It is often impossible to determine the variety of bacteria involved because:

1. The infection is often a mixed one.
2. The so-called saprophytic cases often contain pathogenic bacteria.
3. Pathogenic bacteria are present in the lochia in a considerable percentage of apparently normal cases during the puerperium.
4. Blood cultures frequently give negative results.

We will consequently consider all cases as puerperal infection.

III. PATHOLOGY.

The disease is essentially systemic. It has ceased to be local after fever has developed. The bacteria probably soon invade all the tissues of the body. The following facts support this statement:

1. The bacteria have direct contact with the general circulation through the infected thrombi in the uterine sinuses.
2. The lymphatic vessels and veins in the parturient canal are large and active.
3. Blood cultures frequently show the presence of bacteria.
4. The severity or duration of the disease shows little or no relation to the presence of retained tissue in the uterus or of pelvic exudates.
5. The severity and duration of the disease depend entirely upon the virulence of the invading bacteria, the body resistance and the time required to develop a general immunity.
6. The presence of inflammatory exudates in the pelvis is not an essential feature of the disease as they are largely accidental, depending upon the amount of irritation the infective material may produce and on emboli that may result.
7. Excision or incision of abscesses in the pelvis does not lessen the severity or shorten the duration of the disease.

A. General Pathology.—As the disease is essentially a systemic infection, the important pathology is the general pathology of infection and immunity, a subject which is too large to discuss at this time.

B. Pelvic Pathology.—The pathology in the pelvis in puerperal infection is of secondary importance when considered from a practical viewpoint.

Bacteriologic Examinations.—The bacteriologic examination of vaginal and uterine secretions is of relatively small value, as the results are often uncertain and misleading. The following statements emphasize these facts: Rosowsky(1) found in the vaginal discharge of sixty-one normal nonpregnant women the anaërobic *streptococcus putridus* in 40 per cent. Zangemeister (2) found hemolyzing streptococci in 13 per cent. of women during the puerperium. Winter(3) states that approximately 33 per cent. of women have virulent streptococci in the vagina. Numerous observers have reported the presence of virulent bacteria in the lochia of afebrile cases. Blood cultures are the only means at present of accurate diagnosis of the variety of infection. Although bacteriological examination is not of much practical value as yet to the patient, it should be done as an interesting, instructive and fruitful research problem. Recent observations have shown that such examinations should always include anaërobic cultures, especially of the blood.

Other pathologic features in puerperal infection will be referred to in discussing the principles of treatment.

IV. DIAGNOSIS.

Although the clinical history, symptoms and findings usually determine the diagnosis, care should be exercised to exclude other infectious diseases, especially pyelitis, appendicitis, and cholecystitis. The danger of mistaking puerperal for some other infection is very liable to happen if one depends upon the laboratory diagnosis, especially as regards the examination of the uterine and vaginal secretions.

V. TREATMENT.

A. General.—As the disease is chiefly systemic, the treatment should be essentially general. With the exception of the few infectious diseases treated by specific remedies, the reactions of the body have to be relied upon to destroy the bacteria in all infections. Puerperal infection is no exception to this rule. The important part of the treatment of puerperal infection is the use of remedies to increase the body resistance, and the abandonment of measures that interfere with the development of immunizing substances.

Physiologic resistance is increased by all measures that promote health; important among them are general hygiene, food, sleep, and good elimination. The outdoor treatment is the most valuable remedy known as yet in the treatment of puerperal infection. The outdoor treatment is well recognized in combating tuberculosis. It is as important in puerperal as it is in tubercular infections. The beneficial effects of outdoor treatment in our cases have been very noticeable, especially as regards improvement in appetite, sleep, temperature and pulse. Two quarts is the minimum amount of fluid which is given to promote elimination. Stimulants are not used, as rest not action is desired. Anodynes or hypnotics are given in moderation to relieve pain and to procure a minimum amount of six hours' sleep. We believe that fresh air and sun baths are good substitutes for tonics. An ice-bag is kept over the lower part of the abdomen during the acute period of the disease, and the head of the bed is elevated to promote drainage.

B. Local.—As the pathology in the pelvis is of secondary importance, the local treatment is of relatively little value. We believe that much of the local treatment that physicians still use quite generally, is productive of much harm and is of little benefit.

Vaginal and intrauterine douches and medicinal applications are harmful, meddlesome and useless procedures that are of historic interest only.

All products of conception be forcibly removed from the infected uterus? This continues to be a debatable question. The various opinions of authorities upon the subject may be briefly summarized as follows:

1. It should never be emptied except for hemorrhage (4).
2. It should always be emptied except when hemolyzing streptococci or pelvic inflammatory exudates are present (5).
3. It should always be emptied when products of conception are known to be present, irrespective of bacteriologic findings (6).

Never to explore or empty the uterus except for hemorrhage seems to us to be consistent with the modern interpretation of infection and immunity. The infected uterus if left alone will soon spontaneously expel any retained products of conception. There is no evidence that the presence of such tissue increases the growth or virulence of the more dangerous bacteria. Emptying of the uterus removes most of the bacteria of decomposition, but they are not of much importance as regards morbidity or mortality. In the so-called saprophytic cases one can never exclude with certainty the presence of pathogenic bacteria. It is not an uncommon observation to see a normal temperature with retained decomposing tissue in the uterus. To say that "the infected uterus should always be emptied except when hemolyzing streptococci are present" condemns surgical interference in the severer cases. Curetage is a peculiar remedy if it can be of value for the milder and be contradicted in the severer types of the disease.

There must be less danger in forcibly emptying an infected uterus in the presence than in the absence of an inflammatory exudate, as the blocking of the veins and lymphatics by the exudate lessens the danger of the extension of the infection and the production of emboli.

Cureting with the finger or instrument produces raw surfaces, disseminates the infection, may dislodge septic thrombi and thus produce embolic infections and pelvic inflammatory exudates.

In case of hemorrhage, which means separation of the decidua or placenta, a gauze pack in the vagina or in the lower uterine segment will stop the bleeding and hasten spontaneous expulsion of the retained tissue. The gauze thus employed interferes with drainage and increases the absorption of toxins, but its use is the choice of the lesser of two evils. The infliction of traumatism upon the infected uterus by forcibly emptying it is inconsistent with the modern treatment of infected wounds, and is an inheritance of a dangerous tradition which was based upon a false pathology.

Pelvic Inflammatory Exudates.—In nonpuerperal cases, gynecologists agree that operation should seldom be done during the acute period of the disease. There is less indication and more objection to operation in acute puerperal than in acute nonpuerperal cases. In the puerperal case the exudates in nearly all cases entirely disappear by absorption, which is not true in the nonpuerperal state. This exudate is also less amenable to surgery than the nonpuerperal. The tissue which is undergoing involution has a relatively small resistance to surgical interference. When abdominal section is made in these cases the exudate is often found to be of such character that it cannot be safely removed. It is not advisable except in individualized cases to attempt incision and drainage, as the abscesses are always multiple, cannot all be opened, and secondary infection is almost certain to result. In a few cases the abscess will point to the surface, generally where a secondary colon bacillus infection has taken place, and indicate incision and drainage.

VI. PUS FREE IN THE ABDOMINAL CAVITY.

This fortunately occurs in only a small percentage of cases. In most of the cases where it is found the patient is in a hopeless condition. The infection is usually streptococcic and often of a hemolyzing type. It is not often possible to definitely determine the presence of free pus in the abdominal cavity without section. In suspicious cases, especially if observation shows the tendency of the patient is to get worse, we believe exploratory puncture through the posterior vaginal fornix is indicated, but not in moribund cases. If this is done quickly with nitrous oxide anesthesia, it does not materially disturb the patient or lessen the body resistance. It enables one to determine quite accurately the pelvic pathology, to solve the indications for treatment, and establishes good drainage. Such an incision would often exclude possible indications for abdominal section. If conditions are found that seem to indicate abdominal section, the puncture opening is utilized for drainage.

VII. THROMBOPHLEBITIS.

This subject was quite thoroughly reviewed last year at the meeting of the American Medical Association in the section of Gynecology, Obstetrics and Abdominal Surgery. The opinions of the various authors will consequently not be repeated here. It is difficult to estimate the value of operations where thrombosed veins were ligated or excised, as the results without operation cannot be determined. It would seem improbable that the benefit that would accrue from such an operation, especially ligation—the operation usually advised—would outbalance the injury inflicted upon the body resistance. The infective bacteria cannot be confined by ligatures, and resultant trauma to the veins is probably more likely to extend than to limit the thrombosis.

VIII. PERSONAL OBSERVATIONS.

One hundred cases are included in this report, which dates back eight years when operative interference was discontinued except in individualized instances. Nearly all the patients were the severely infected ones who are usually referred to a hospital. Of the 100 patients, ninety-one recovered and nine died. Seven of the fatal cases had generalized peritonitis and were in an apparently hopeless condition on admission to the hospital. One died from large multilocular pelvic abscesses, which were incised and drained and terminated in generalized peritonitis and death. The other death was from a general hemolyzing streptococcus infection with numerous mycotic abscesses.

With the progress of time less operative work has been practiced, with coincident decrease in morbidity and mortality.

Vaginal section was made twelve times for exploration and drainage. Seven of the cases thus treated occurred in the first twenty of the series, and only five of the patients out of the last eighty were so treated.

Forty-nine of the patients had pelvic exudates, which varied in size from slight indurations to masses that extended from the pelvic floor to the umbilicus. The relatively large number of these exudates is accounted for by the fact that most of the patients had been cureted one or more times and had become desperately ill before they were sent to the hospital. None of these exudates have required incision and drainage. These exudates had practically all disappeared at the time the patient left the hospital, after an average stay of between three and four weeks.

The exudates have shown very little tendency to absorb while the fever existed. When the temperature became normal, *i.e.*, when the exudate became sterile, absorption took place rapidly. Diminution in the size of the exudate should not be expected in the presence of fever.

IX. ABDOMINAL SECTION.

Six of the patients were subjected to abdominal section. All of these operations proved to be mistakes in diagnosis or surgical judgment. Three of them were of special interest. In two a large solid inflammatory exudate with extensive intestinal involvement was found. The abdomen was closed in both cases without disturbing the exudate. In both of the cases the exudate had entirely disappeared when the patient left the hospital about four weeks later. In one of these patients an abdominal section was made for suspected tubal pregnancy. The section revealed the presence of a streptococcus abscess involving the top of the left broad ligament, the ovary and the tube. Excision of the diseased tissue was easily made without much contamination of adjacent surfaces. Although this patient had practically no fever and was not very ill before operation, after the section she had a temperature of 103° to 105°, had extensive suppuration and sloughing, and was for weeks dangerously sick. The indications are that this patient without operation would have made an easy, quick and complete recovery.

Sixty of the patients were treated by supportive treatment only; in most of the other patients the treatment consisted chiefly in the use of remedies to increase the body resistance.

In many of the patients the temperature curve has been peculiar in that the fever would be relatively high for periods of two or three days, with intervals of much lower average temperature for about the same time. This peculiar fever was probably due to remittent escape of bacteria into the blood stream.

X. CONCLUSIONS.

1. Puerperal infection is essentially a systemic disease; the treatment should be chiefly general.

2. The only general treatment of established value as yet is the use of remedies to increase the body resistance and thus favor and hasten the development of systemic immunizing bodies.

3. Retained products of conception should be left to escape spontaneously, except in case of hemorrhage when gauze packing should be used to hasten separation of retained tissue and to stimulate uterine contraction.

4. Pelvic inflammatory exudates usually disappear entirely by absorption. Only exceptional cases require incision and drainage.

5. Suspected cases of free pus in the abdominal cavity indicate vaginal section to determine the diagnosis and the indications for treatment.

6. The treatment which remains in quite general use is much more dangerous than the disease.

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THE TREATMENT OF PUERPERAL INFECTION.*

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(With One Chart.)

PUERPERAL infection is a condition frequently met with, is serious in its consequences, and one in which ideas as to treatment vary widely. It may be said that there are two schools, one advocating active, local treatment; the other, as little as is consistent with good judgment.

Immediately following labor the temperature may rise from exhaustion or later from causes other than infection, but when the fever reaches 100.4°, and is present for any length of time, an infection of the generative tract should be suspected and this idea adhered to until definitely proven to be otherwise.

Prevention or prophylasis is of primary importance in the consideration of any disease but especially is this true in puerperal fever. Though an occasional infection may arise after childbirth when no examination has been made and when there is no apparent cause, the vast majority are to be attributed to the accoucheur.

As Ahfeld has stated,(1) autoinfection may arise from a distant point of suppuration with metastasis through the blood stream; by extension from contiguous disease; and from the presence of pathological organisms in the vagina and vulva. Every one agrees that pyogenic bacteria are always present in the vulva and lower portion of the vagina, though their presence in the upper part of the vagina is still an unsettled question. From the work of Krönig(2) and of Williams(3) in this country it appears that the upper two-thirds harbors no pathogenic bacteria with the exception of the gonococcus.

It is known that as the puerperium progresses, the previously aseptic uterine cavity is invaded by bacteria, accordingly the innoculation of the interior of the uterus, by extension along the lochial stream, of these organisms constantly present at the vulva, would seem a reasonable and probable explanation for some of the obscure cases of infection.

The risk involved by making frequent vaginal examinations is probably the greatest in the production of puerperal infection. We are unable to render aseptic the vulva and lower vagina, and even when extreme care is used in the preparation of the perineum and the hands, the risk is not entirely eliminated. The hope that antiseptic vaginal douches would aid in this respect has only shown that infection is more frequent following their employment.

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*Read before the Medical Society of the City and County of Denver, May 20, 1913.

It is said that one of the greatest advances in modern obstetrics is the substitution of external palpation for vaginal examinations in order to determine the variety and position of the child and engagement of the head. The large majority of one's cases are better conducted with no vaginal examination at all. It is safe to say that three-fourths of the examinations made by physicians at the time of labor are unnecessary. I would urge the more universal employment of rectal examinations when, either to conserve our time or for some other reason we wish to determine the amount of dilatation of the cervix and descent of the head. Though occasionally this examination is unsatisfactory, it is almost always reliable and carries with it no risk of infection.

Infection following coitus during the last few weeks of pregnancy, a practice not uncommon among the lower classes, is a factor in the production of infection. Not only are pathological organisms tracked upward, but it is shown by various observers that the penis is a carrier of streptococci, in from twelve and one-half (Asacura)(4) to 75 per cent. (Liepmann)(5) of the cases in which to determine this point, cultures were taken.

Dirty instruments and hands, the patient's fingers, and skin diseases on the hands of the obstetrician are all too well recognized as factors to need comment here. Other causes such as long delayed labor, especially when the membranes have ruptured early, bruising of the tissues, and the retention of pieces of placenta or membranes, require little discussion. The full bath at the beginning of labor is said to be the source of infection in women with relaxed outlets, though the experiments of Hoermann(6) putting women in water colored with methyl violet would tend to disprove this. Air infection still has its adherents, though definite cases from this cause are difficult of proof and are heard less of as our aseptic technic improves. Cervical tears offer ready access to bacteria into the lymphatics, but because there is an added risk of infection by manipulation they should not be repaired immediately unless the cause of severe hemorrhage. This is in contradiction to the treatment of perineal tears; the opportunity for infection being one of the arguments for their immediate attention.

The treatment of puerperal infection, after it is once established, depends upon the pathological anatomy or part involved, and upon the kind of organism present. Infection around perineal stitches and vaginal ulcers is revealed by inspection; removal of the stitches, local cleanliness and the application of antiseptics naturally follow. The principal concern is that they may be later on the source of infection higher up, especially when a cervical tear exists. Accordingly the idea is to guard against this extension by the avoidance of vaginal examinations and douches which tend to force bacteria upward.

One is unable to say with the initial chill and rise of temperature what the condition present is, but as the most common lesion in puerperal infection is an endometritis, our preliminary treatment should assume its presence. Ergot undoubtedly helps to contract the uterus and prevent invasion of bacteria along the blood and lymph vessels and should be given. The statement that ergot closes the os and prevents good drainage (Ward)(7) does not hold good during the first few days, and should this result later it may be discontinued.

If within twenty-four hours the temperature, pulse and general condition do not improve, it is a matter of some importance to decide whether one has to deal with a septic or putrid variety of infection, and accordingly cultures are taken. Should there be any doubt as to whether the uterus is empty, a finger exploration is made, and this is followed by an intrauterine douche of normal salt solution.

The clinical symptoms and character of discharge are often an indication of the kind of infection. We recognize the scanty serous discharge with no odor as the serious one, but a positive diagnosis is arrived at only after a bacteriological examination of the lochia.

The bent glass tube devised by Little(8), with elastics tied to a thread for suction is simply prepared and easy of application.

Bumm(9) and Doderlein(10) have demonstrated that nature's method of protection against invasion beyond the endometrium is the formation of a layer of round cells, through which the bacteria penetrate with difficulty. In mild and putrefactive infections this leukocytic barrier is thick, in septic forms it is either lacking or imperfectly developed, and the organisms rapidly invade, gaining access to the musculature and through the blood-vessels and lymphatics reach the tissues beyond. In our treatment, therefore, the intention should be to conserve this leukocytic barrier and if with judgment it may be avoided, not to disturb it by any internal examination or local measure.

In palpating the interior of the uterus, should pieces of placenta or membranes be detected, they are detached with the finger and removed with ovum forceps. Occasionally, though rarely, it may be necessary to resort to the curet in order to detach a firmly adherent piece, but to scrape the interior of the uterus when an infection is present is a dangerous custom, and one which is absolutely contraindicated. Young and Williams(10) of Boston say that the mortality in puerperal infection is increased almost 10 per cent. by the use of this instrument.

Following palpation of the uterine cavity, the intrauterine douche serves to wash away the discharge, what infection we may have introduced and if hot, to stimulate contraction and control the bleeding. Fortunately after a single intrauterine douche, there is, in the vast majority of cases, rapid improvement and no further local treatment is necessary. Such cases are due to infection with mild pyogenic organisms which invade the tissues but slightly, or they are sapremic, that is from putrefactive bacteria which produce symptoms from absorption of toxines within the uterus.

The following is a striking example of this type. A woman, between five and six months pregnant, developed a slight, bloody vaginal discharge. Her temperature which was 99.4° was attributed to the slight activity of an old pulmonary tuberculosis. She was put to bed and on the following day the temperature was normal and the bleeding had stopped. On the evening of the next day the patient had several chills, the temperature rose to 101° and a foul, bloody vaginal discharge appeared. When I saw her in the morning the temperature was 102°; the fundus uteri was two fingers' breadth below the umbilicus; there were pains about every three minutes and a profuse, foul vaginal discharge was present. She was sent to St. Luke's Hospital and shortly after her arrival, expelled a macerated, five and a half months' fetus. The placenta could not be expressed from above and accordingly she was prepared for operation: the cervix was found to admit two fingers readily; a culture was taken from the uterine cavity; the foul smelling placenta detached digitally, removed with ovum forceps and an intrauterine douche of normal salt solution given. The culture which was examined by the late Dr. H. S. Denison showed a gram positive, nonmotile bacillus, slightly longer than its width and unidentified by culture medium.

The accompanying chart shows the result of a single intrauterine douche of salt solution, and the subsequent course of the disease.

It is the case in which improvement does not follow this single treatment that we are in doubt as to what course to pursue. Recognizing that the condition is serious, it is our natural impulse to want to do something, and overdoing is too often the result. One is guided in his judgment by knowledge of the pathological anatomy and bacteriology of the particular case. As long as a foul smelling discharge continues, and there is no improvement in the temperature and pulse, a simple putrefactive infection confined to the uterus will probably be benefited by a repetition of the douche or a daily washing out of the foul material with the maintenance of good drainage.

If of a septic type, there should be absolutely no local interference. The custom of ordering frequent or daily intrauterine douches simply because the patient is known to have puerperal infection, is without reason. In this class we can only depend upon supportive measures: drugs, diet, fresh air, with heat or ice to the abdomen, and the forcing of large quantities of water by mouth and bowel.

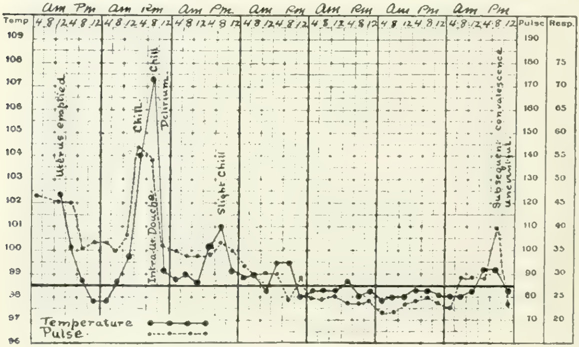

CHART I.

The frequent use of intrauterine douches of iodine, alcohol, lysol and other antiseptics is a common practice. Certain of these solutions are positively dangerous. Several deaths have been reported from mercurial poisoning following this use of bichloride of mercury and poisoning has been known to result from the use of lysol. We are unable to say that the local effects of other antiseptics are not injurious. As it has been demonstrated by Bumm(22) that even 1–1000 bichloride solution will not penetrate the tissues for more than 1/10 millimeter in thirty minutes; these solutions are, therefore, incapable of reaching the bacteria which have invaded the uterus. They are possibly of value only in the mild type of infection which has been considered above. In the septic type it is more probable that the manipulation made necessary by their employment is an added risk in that the weak, leukocytic wall is disturbed and more rapid invasion follows. The advocates of the antiseptic intrauterine douche are unable to quote any better figures than those who follow the waiting method.

The advisability of hysterectomy in the class of infection with no extension beyond the uterus is a question which may be considered. To be of value the operation would have to be done early in which case many uteri would be removed unnecessarily. The rare formation of multiple abscesses within the uterine wall offers a restricted field for this operation. Sampson(13) believes intramural abscesses to be more common than reported cases would indicate. He advises first an exploratory laparotomy to locate the abscess, extraperitoneal drainage when possible, if necessary an hysterectomy. Noble(14) claims that hysterectomy in these cases has been associated with a mortality of 25 per cent.

In the treatment of parametric extensions from uterine infections the conservative plan is the better one. Good sized masses which at first one would judge could not subside without operation may disappear spontaneously.

I had, a short while ago, an Italian woman who developed an antepartum infection. Fever came on the day before she commenced to have pains and continued between 102° and 103° throughout labor. The membranes did not rupture until shortly before the birth of the child and I attributed the infection to coitus which had been indulged in six days before. In the broad ligaments, on either side, masses formed which were both fully the size of a lemon. These under rest, cold to the abdomen, later hot douches, completely disappeared in thirty-one days.

If a definite abscess forms in the cellular tissues of the broad ligament it is opened if possible by the extraperitoneal route. It is better to wait than operate early. The sense of fluctuation in this region is usually absent and often a good-sized mass may be found to contain no pus or only small scattered foci. Drainage in these early cases is followed by little improvement and later such an abscess may point near the rectum, vagina or follow the extraperitoneal route upward toward Poupart's ligament, when extraperitoneal drainage, preferably through the vagina, is comparatively easy.

Pus tubes and ovarian abscesses because they keep the patient in a septic condition, and are a constant danger in the production of peritonitis are necessarily removed as soon as they are felt by bimanual palpation. If a pus tube points low in the pelvis it is preferably opened through the vagina. Streptococci retain their virulence for a great length of time and if a laparotomy becomes necessary even months after an active infection has subsided, there is still danger of peritonitis through spilling pus.

The development of a general peritonitis may be considered almost necessarily fatal; there are reports of very few favorable cases. Our only hope, however, is to freely open and drain the abdominal cavity.

I saw not long ago, such a case with recovery. The woman had induced an abortion on herself. An infection followed but in spite of this her physician curetted the uterus. Within two days a general peritonitis developed. The patient was placed in the hands of Dr. F. W. Bancroft and together we opened the abdomen, which was full of seropurulent fluid; the intestines matted together and covered in places with fresh exudate. We washed out the cavity with a Blake tube, drained the pelvis through the vagina; the abdomen in both flanks and in the midline; having little hope of recovery. From a patient in extremis she rapidly rallied, and the convalescence was practically uneventful. I saw her again this year, she had performed another abortion on herself, following which she developed a mild pelvic inflammatory disease. Cultures were not taken from this case in the first instance and though it is possible the infection was gonorrheal, the tubes were not involved; and smears did not show the presence of the infection in the cervix or urethra.

The subject of septic thrombophlebitis has recently received a great deal of attention by obstetricians. Based upon the good results obtained by aural surgeons in cases of infected thrombi complicating mastoid disease, Freund(15) suggested that the pelvic veins be exposed by laparotomy and excises or ligated distal to the thrombus.

The number of operations reported while too small to enable one to form any really definite conclusions is, however, sufficient to show that the operation is feasable and should be given a fair trial. The certainty of diagnosis is one of the problems in its recommendation; often it is not positive until the hope by operation is passed. Williams(16) lays most stress on the occurrence of frequent chills and a hectic temperature, when the thrombosed vessels can be palpated as worm-like masses high up in the outer portion of the broad ligament the diagnosis is assured.

Thrombophlebitis forms a large per cent. of the fatal cases of puerperal fever. Williams(17) states that it is found at autopsy once in every three severe cases of puerperal infection; Lenhartz(18) in 50 per cent. The mortality under expectant treatment is variously estimated. Lee(19) collected 566 nonoperative cases with

327 deaths; Latzkos(20) had 199 cases with sixty-eight deaths; this gives a mortality of 51.6 per cent. Any operation, therefore, which will lower this death percentage should be considered.

The hope that antistreptococcic serum would prove of great benefit in puerperal infection has not been substantiated, and according to the report made to the American Gynecological Society by Williams, Cragin, and Newell(21), the use of bacterial vaccines is of practically no value, also, though I have had no experience with the use of formalin or collargol by intravenous injection and of nuclein, they have received but little commendation in the literature.

Before closing this brief consideration of the treatment of puerperal infection, mention should be made of the benefit from out-door treatment of this disease. By its employment Young and Williams (10) in a report from the Boston City Hospital showed that the mortality of their cases had been reduced nearly 20 per cent. They say much is to be hoped for in the open air and sunlight to strengthen the patients' resistance, increase the hemoglobin and decrease hemolysis. They would consider it at present the most effective treatment known.

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1405 GLENARN PLACE

THE PELVIC FLOOR, RECTOCELE, CYSTOCELE, AND PROLAPSUS UTERI, ETIOLOGY, MECHANISM AND BEHAVIOR.

BY

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(With Four Illustrations.)

A CLEAR conception of the etiologic factors leading to prolapse of the vagina and uterus is necessary in order that the mothers of a nation may receive the benefit of the best prophylactic measures during labor and the most efficient repair (when necessary) after labor is over.

The importance of this knowledge from a sociologic as well as a professional standpoint cannot be overestimated.

Prolapsus of the vagina and uterus may result from changes occurring in (*a*) the perineum and lower third of the vagina (lower segment), (*b*) the paravaginal tissues and upper third of the vagina, (*c*) the parametrium and ligaments of the uterus (upper segment), and (*d*) both upper and lower segments of the pelvic floor together; and demands a careful detailed study of the virginal, marital gestation, and postpartum anatomy of each.

The lower (floor) segment is composed of bones, muscles and fasciæ, and the walls of three canals—anus, vagina and urethra, passing at a certain angle through the same.

The stationary *sacrum*, straight at birth, gradually later becoming curved forward toward the symphysis, both narrows and strengthens the outlet, extending as it does with the mobile *coccyx* as far forward as the axis of the inlet. These two posterior bones with the *ischia* and *pubes* laterally and anteriorly, provide for the strong muscle and fascia attachments so necessary to the pelvic floor anterior to this inlet axis point.

As the central perineal tendon is the key of the pelvic floor, the muscle and fascia attachments should, for gynecologic demonstration, be considered as arising from it, to the more easily demonstrate their (antagonistic) anatomic importance.

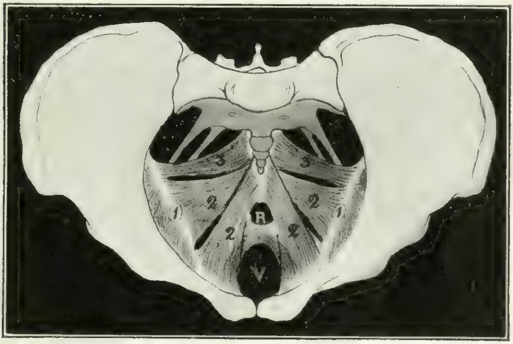

FIG. 1.—The levator ani seen from above. (1), The white line; (2), levator ani; (3), the coccygei; (R), opening for rectum; (P), central perineal tendon portion of levator; (V), opening for vagina.

(1) The two *levator ani* muscles (rectovesical fascia above, levator ani fascia below), derived on either side of the pelvis from the *white splitting-lines* of the obturator internus fasciæ, extend to the spines of the ischia, and from there are reflected to meet at the tip of the coccyx and unite in the midline to form a perforated sling.

This perforated sling (*muscular and fascial*) surrounds the anal opening, passes below and supports the ampulla of the rectum, then unites at the central perineal tendon with the five other floor muscles and fasciæ, then loosely surrounds the lower third of the vagina, passing thence to the pubes 2 1/2 cm. external to, and 3 1/2 cm. below the symphysis upper margin.

(2) The (triangular) *coccygeal* muscles on either side arise from

the spines of the ischia, and unite by their bases to the sides of the coccyx, and the last segment of the sacrum. They serve to help raise and support the mobile coccyx, after defecation and parturition.

(3) The *sphincter ani* muscle (backward tractor) passes from the central perineal tendon backward, surrounds the anus, to be attached to the tip of the coccyx.

(4) *The bulbus cavernosi muscles* (forward tractors), two slender muscles arising from the central perineal tendon on either side, pass forward to be inserted in the corpora cavernosi clitoridis, and assist in holding the central perineal tendon in its correct position.

(5) The two layers of *triangular fasciæ* extending from the central perineal tendon forward as two perforated sheets, are attached bilaterally to the tuberosities and rami as far forward as the pubes.

These two important sheets of fascia rigidly hold the central perineal tendon and vaginal introitus in their proper position in the preaxial part of the pelvic floor.

(6) *The transverse perineal muscles*, small in size, arise from the central perineal tendon and pass to either tuberosity and the adjacent rami.

From the foregoing it is apparent that the anatomic perineum extending from the clitoris to the anus might clinically be prolonged to the bony coccyx; it being equally important posteriorly with what one understands by the *perinuem gynecologic* (formed by the meeting of seven muscles and their fasciæ which is in reality the wedge-shaped *central perineal tendon or body*.

(7) *The vagina* is a nonstriated muscular, squamous epithelium lined tube passing obliquely from before backward and upward through the pelvic floor, with its greatest lumen at the fornices near the cervix, and its smallest at the introitus near the hymen, where it is still further narrowed if this latter be intact.

The vaginal walls are collapsed antero-posteriorly in an H-shaped manner. The more loosely attached anterior being at least partially supported by the closely opposed more firmly attached posterior wall.

(*a*) *The virgin vagina* about parallel with the conjugata anatomica (promontory suprapubic line), is practically horizontal when standing, and forms a slightly acute angle with the normal anteverted uterus above.

This "horizontalness" is very necessary to allow the vaginal canal to pass through the pelvic floor with the least possible weakening anatomically, and at the acutest angle to the anteverted uterus above, to provide the greatest resistance to the intraabdominal pressure by spreading this pressure more evenly over the entire floor when rising and falling with the inspiratory and expiratory increase and decrease. This is especially true during violent exertion when the "horizontalness" of the vagina and the normal anteversion of the uterus are both creased, making the angle still more acute and prolapse consequently more difficult; indeed, with an intact hymen, the normal pelvic floor is almost as strong as that of the boy, so architecturally perfectly is it constructed.

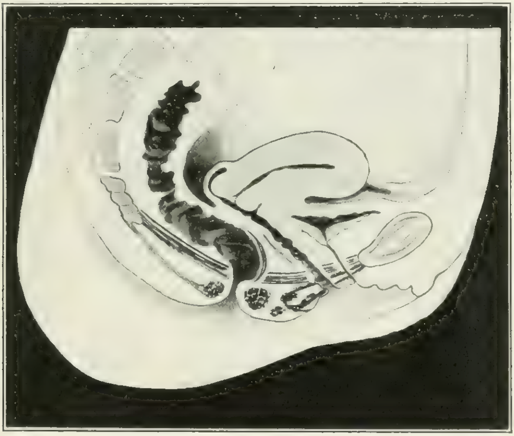

FIG. 2.—FIG. 2.—The normal angle of the pelvic organs to the canals passing through the floor and the normal perineum below.

(*b*) *The Marital Vagina "Nulliparæ"* with the hymen ruptured has suffered its first traumatic lesion. The introitus is now situated slightly more posteriorly than before (at least as far as the posterior wall is concerned).

The "horizontalness" of the vagina in the pelvis is slightly lessened. The whole vagina throughout becomes longer, wider and looser.

Married nulliparæ frequently show a marked congenital looseness of the para-tissues (-metrium -cystium and -vaginum) combined with a tendency to undue cervical anteposition, and even corpus retroversion and under sudden and repeated excessive increase of intraabdominal pressure (while lifting weights, etc.), to some primary prolapsus uteri.

(*c*) *The Vagina of "pregnancy"* undergoes increased lengthening, with marked loosening of, and mobility of the parametrovaginum and pelvic floor, a change that is sometimes so marked at term that the vaginal wall in late pregnancy may protrude slightly through the introitus during bearing down even before labor begins.

The simple resorbtion of fat as a cause of this looseness of the lower segment of the pelvic floor in pregnancy as pointed out by Hoffman would be counterbalanced, at least in part, by the elevation of the uterus at this time.

(*d*) *The "Parous" vagina* due to the passage of the term child (especially if large) undergoes an extreme dilatation, and often some submucous tearing, usually much greater in extent in unduly rapid deliveries (due to the pernicious use of ergot, occipto-posterior rotation rapid forceps deliveries, or rapid extraction, not forgetting the lack of moulding in justomajor pelves).

Each succeeding labor can naturally be expected to be the cause of some additional dilatation and perhaps tearing if the children are larger as is frequently the case.

While postpartum involution of both vagina and paravaginum occurs, it perhaps never entirely "involutes" to the shortness and narrowness previous to the last pregnancy, but frequently allows some permanent eversion or prolapsus of the (especially posterior) vaginal wall through the introitus during increased intraabdominal pressure, even though there be no appreciable perineal tear.

This permanent increased vaginal length *per se* is physiologic, for it allows an easier maintainance of the normal elevation of the cervix of the multiparous uterus if anteverted, and prevents undue traction on the cervix in slight vaginal prolapses.

The increased length of the parous uterus also has a prophylactic-value (if normally anteverted) by allowing a longer posterior surface on which the intraabdominal pressure can act.

(8) *The so-called lacerations of the perineum* (*central tendon*) in labor, (levator ani subampulla portion, including the rectovesical and levator ani fasciæ posteriorly; together with the bulbus cavernosus and triangular fasciæ anteriorly) allow the backward traction of the sphincter ani to drag the introitus, *especially the posterior vaginal wall and remains of the perineal tendon* backward toward the coccyx, the tip of which latter also recedes somewhat by pointing

more downward instead of being held firmly in a "near" horizontal direction.

The unopposed sphincter ani muscle also drags the anus more posteriorly and nearer to the receded coccyx, markedly increasing the acuteness of the rectoanal angle, increasing the liability to stagnation of feces in the rectal ampulla, the anterior wall of which becomes atrophic, and in turn causes atrophy, eversion and prolapse of the posterior vaginal wall through the enlarged and retroposited introitus (rectocle).

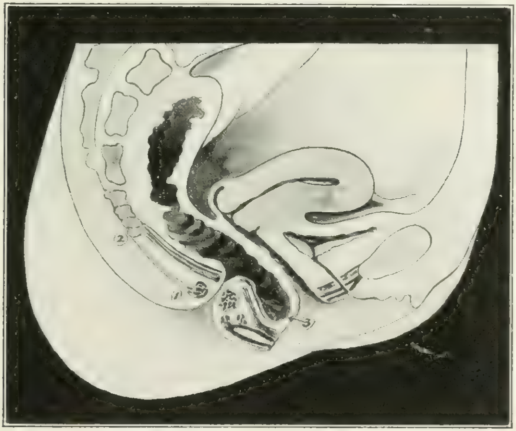

FIG. 3.—Torn central perineal tendon. (1), The unopposed sphincter anus has dragged back the anus and remains of the perineum and posterior vaginal wall nearer to the coccyx; (2), the coccyx itself has also receded somewhat and points more downwards. The ano-rectal angle being more acute increases constipation. The utero vaginal angle is less acute, predisposing to prolapse; (3), the ampulla of the rectum has lost its support and become distended and is protruding more and more through the vaginal introitus as a "*rectocele*" causing traction on the uterus. The support by the posterior vaginal wall to the anterior is also lost, predisposing to cystocele.

The angle between the now "more vertical" vagina and the uterus (even if the latter be normally anteverted) becomes more obtuse and consequently less able to resist the traction on the cervix by the rectocelic vaginal wall which latter becomes more and more prolapsed as the feces increasedly distend the rectal ampulla.

The degree of laceration of the central perineal tendon (submucous or open) usually governs the size of the rectocele which may vary in size from an almond to that of a hen's egg or even larger.

The vagina (at least in the lower third) apparently does not prolapse circularly like a prolapsing rectum, but the anterior and posterior walls prolapse independently, or simultaneously, due to the difference in length and resistance of their independent attachments.

In the dorso-buttocks position, a rectocele till then nonapparent if empty, usually comes strikingly into view when bearing down, showing the characteristically pale smooth vaginal mucosa if of long standing; or if the ampulla be filled with inspissated feces, it may appear at the introitus as a tumor-like enlargement in the posterior vaginal wall.

The little finger inserted in the rectum during bearing down easily passes into the (empty or feces filled) dilated ampulla and causes its further protrusion from the vaginal introitus.

During this manipulation the remaining perineal attachments (if any) of the levator ani muscles and fascia can often be palpated, under the lateroposterior vaginal wall about 3 cm. above the remaining carunculæ myrtiformes by the index-finger of the other hand.

(*b*) *The anterior vaginal wall is said to prolaspse more easily* than the more firmly attached posterior wall, due to its much looser attachment to the bladder (paracystovaginum), and there is no doubt but that the real frequency of *cystocele* is much underestimated because it is more out of sight during examination in the ordinary dorsal-buttocks position.

Cystocele by no means always accompanies nor is accompanied by perineal laceration and rectocele. Some of the worst cystocele occurs in young primiparæ entirely free from posterior vaginal wall or perineal lesion.

By placing the index-finger in the vagina and depressing the posterior vaginal wall, a cystocele (often till then unsuspected) if present will usually come clearly into view, or if large, protrude from the introitus when simply bearing down, as a round (1–3 cm. diameter or longer) enlargement, and is often mistaken by the patient for a prolapsed uterus.

Incontinence on exertion is common if the bladder be full. The incomplete evacuation often present allows the residual urine to become ammoniacal, resulting in catarrhal cystitis, lack of contractility and later still less complete evacuation, and further increase in the size of the cystocele and consequent increased dragging on the intermediary cervix.

Congenital looseness or lowness or both of the paracystovaginum often has been given as a predisposing cause of cystocele, doubtless aided by the often violent trauma in cases where the thickened anterior uterine labium becomes caught between the descending head and the pubic symphysis with stretching and tearing of the weak parametrovaginocystium.

The lateral traction of the transverse perineal muscles on perineal tears undoubtedly adds to the gaping of the posteriorly drawn introitus vaginæ thereby allowing still easier prolapse of the vaginal walls.

This gaping condition of the vaginal introitus which so often assists in bringing about that distressing condition known as "*Garulitus Vaginalis*" due to the entrance and exit of air on change of intraabdominal pressure when sitting, standing or walking is probably much worse when extensive or complete tears of the triangular ligament occur.

By the accompanying schematic drawing of the "organless pelvis" the author has tried to depict the rectal, uterine, vaginal and bladder (upper floor segment) supporting tissues only.

(6) *The parametrium* is a continuation of that loose connective tissue of the pelvis which extends from the anterior preperitoneal connective tissue to the cavum Retzii, then around the bladder as the *paracystium* then around the cervix and up between the uterus and peritoneum and the leaves of the broad ligaments as the *parametrium*, and down around the upper part of the vagina as the *paravaginum* and backward to the rectum as the *paraproctium*.

It is on the integrity of this loose para-tissue in which the blood and lymphatic vessels and nerves lie and its overlying peritoneum and ligaments that the uterus relies for its correct position in the pelvis.

By virtue of its physiologic looseness the normal mobile retroversion of the corpus and anteposition of the cervix occurs on filling of the bladder and rectum.

In pregnancy this tissue also becomes markedly looser, undergoing involution after parturition. It also contains a certain quantity of loose muscle fiber derived from the external longitudinal layer of the uterus.

Together with the overlying peritoneum it forms (with the exception of the muscular ligamentum teres) the most part of the so-called ligaments of the uterus, *e.g.*, and uterovesical anteriorly;

the broad laterally, and the uterosacral (ligamentum retrahens) posteriorly.

The latter uterine ligaments are in reality the "mesometrium" and very akin to the mesentery of the intestine.

Congenital weakness may be present in the peritoneum itself or in the paratissues or the attachment of the paratissues to the overlying uterus, and underlying vagina and bladder; indeed any or all of these may be illy fitted to withstand abnormal pressure or traction; as is evidenced by the deeper Douglas' sac in one case than in another, as well as by those cases where the anterior culdesac remains at the same level while the cystocelic bladder is entirely stripped off from its uterine and vaginal attachments.

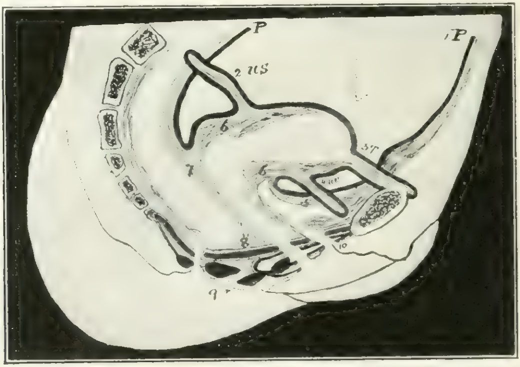

FIG. 4.—The schematic "organless" pelvis and pelvic floor and ligaments in sagital section with only the peritoneum and para-tissues remaining showing spaces originally occupied by the pelvic organs and canals with the normal intact floor muscles and fasciæ. 1 *P*, Parietal peritoneum ligaments; 2 *U.S.*, utero-sacral; 3 *T*, round; (4) *U.V.*, utero-vesical, para-tissues; 5 *V*, vesicum; 6 *M*, metrium; 7 *Pro.*, procteum; 8, levator ani muscles with recto-vesical fascia above and levator fascia below; 9, central perineal tendon meeting place of seven muscles and five layers of fasciæ; 10, the triangular ligaments extending to the central perineal tendon.

This paratissue being also changed in character as a result of infection especially via the cervical abrasions and tears of labor undergoes acquired changes the after results of which are often firm indurated patches or strong bands, which if on one side and high up in the broad ligament are liable to drag the corpus down in latero-version, or if low down in lateroposition, if behind in retroposition, often elevating the cervix and increasing the anteversion, if anteriorly in anteposition with an increased tendency to retroversion, or any combination of these.

These infectious parametric changes vary in character and are by no means always Dupuytren-Palmar band-like and strong in every case but may leave behind a very weak extensile tissue entirely devoid of elasticity and invite purely passive cervical anteposition or corpus malversion or indeed prolapse.

The uterus though not strictly a part of the pelvic floor, yet when it normally lies in mobile anteversion at a right or slightly acute angle to the horizontal vagina is undeniably an important factor in spreading the intraabdominal pressure more evenly over the whole pelvic floor and directing it to the sides and bony retroaxial portion.

From the foregoing it is apparent that prolapse of the uterus can be divided according to its etiology and mechanism into three varieties, viz., primary, secondary and combined or mixed.

(1) *Primary prolapsus* alone is prolapse entirely independent of vaginal traction.

(a) In young nulliparæ it occasionally occurs consequent on sudden violent, or oft-repeated increase in intraabdominal pressure, as from lifting weights, or falls.

The vagina in these cases is apparently in the normal horizontal in its lower third, but the upper third of the vagina may often be found bimanually to be situated apparently too far anteriorly for the cervix to be in the interischial-spines line.

Intraabdominally in young nulliparous women one often encounters parametric slackness and long thin uterine ligaments, accompanied by a short vagina and retroversion.

This ligamentous laxity is possibly congenital, or acquired during the exanthemata of childhood, or perhaps due to the ascending infection at the period described by Schultz or an infantile or adult gonorrhea, or infection following an early unrecognized abortion; not forgetting the possibility also of infections, especially from the rectum, less often from the bladder to the parametrium causing weakening of the so-called uterine ligaments.

Whether the infection be peri- or parametric, or both, the resultant condition may be such that immediate restitution to retroposition of the cervix and anteversion of the corpus after the anteposition and retroversion due to an overfilling of the rectum and bladder may be delayed; and the uterus remain longer in temporary retroversion, thereby exposing it unduly to the influence of sudden or frequently repeated increase of intraabdominal pressure on its fundus and anterior surface.

Again the filling of Douglas' sac by the often very long feces-filled, long mesenteried sigmoid in chronically constipated women, undoubtedly presses the cervix forward in anteposition and favors retroversion even though the bladder be regularly emptied, and may indeed gradually stretch even healthy uterosacral ligaments.

The fact that kyphotic girls often suffer from prolapse, would make it appear as if the lessened intraabdominal area and presumable increase in the intraabdominal pressure was a very important factor in the etiology.

The author of this paper has noted many nulliparæ in the Presbyterian and Cook County Hospitals with retroversion and a certain tendency to prolapse of the uterus that easily on unduly violent exertion might cause such a rapid lowering of the cervix as to give the idea that it was of sudden, instead of gradual occurrence.

(*b*) *In the parous woman* a slight physiologic primary prolapsus uteri is very common. Every woman who has borne a child, is liable to have a slight physiologic anteposition of the cervix, and some physiologic lowering of the uterus, compared to the normal nulliparous condition.

In many multiparæ the portiovaginalis tends to point more downward in the axis of the vagina, even though the corpus uteri is still maintained in anteversion.

Possibly the larger multiparous corpus is more easily maintained in anteversion by the action of the intraabdominal pressure on its longer posterior surface, or by the better developed (parous) teres and uterovesical ligaments anteriorly, or both.

Later the uterus may become retroverted, and possibly the prolapse increase, but examination of these cases month after month, and indeed year after year, often shows the anteversion still well maintained.

The etiology of this slight physiologic primary prolapsus of multiparæ with anteversion, is easy to attribute to a subinvolution of the whole posterior parametrium, and is not due to a slackening of the uterosacral ligaments alone, causing a loss *of the "centre basculer."*

Besides the integrity of the anterior ligaments, doubtless adhesions or tumor or other cause, may also assist in maintaining the anteversion in some of these cases.

The faith placed in the round ligaments alone as supports capable of preventing cervical anteposition, corpus retroversion and prolapsus uteri, and the amount of ingenuity shown in the invention of round ligaments (shortening) operations is absolutely unwarranted.

The author believes that more attention should be paid to combining with it, uterosacral ligament shortening and other procedures to restore the cervix to its normal distance from the sacrum as demonstrated by Dudley, of Chiago, especially when we consider the complex etiology.

(2) *Secondary prolapse* of the multiparous uterus perhaps erroneously considered by many authors as the commoner form, *i.e.*, secondary to (lower third) vaginal prolapsus and traction on the cervix by the vaginal wall consequent on "perineal" tears and retroposition of the remains of the perineum and enlarging rectocele, or cystocele or both.

The prolapsing lower vaginal walls (rectocele and cystocele) gradually drag the uterus down unaided or aided by intraabdominal pressure especially if the uterine ligaments and parametrium be relaxed and the uterus be retroverted and free from adhesions.

Though cases of prolapsus uteri do occur with the uterus at the introitus vaginæ still in anteversion, it by no means minimizes retroversion as a predisposing factor but accentuates the greater need of considering the parametrovaginum and uterosacral and other ligaments.

The size of the introitus is important, but prolapse occurs where the introitus vaginæ is narrow and often no prolapse where it is wide and gaping. If the introitus is narrow, the anterior vaginal wall and cystocele is often found to be the one making the traction; where the perineum is torn and rectocele is present and the introitus gaping the posterior vaginal wall often either acts alone, or in conjunction with the anterior.

(3) *Combined Primary and Secondary Prolapse of the Uterus.*—From the foregoing remarks both the causative factors (primary and secondary) can easily be understood to be present in the majority of the cases formerly considered to be entirely secondary to vaginal prolapse. That the uterus in cases with an enlarging rectocele causing vaginal traction on the cervix is frequently but poorly held up in position by a congenitally weak parametrium and ligaments must be conceded by all clinicans.

Again the frequency of acquired prolapse of the uterus among the poor and hardworking multiparæ is, not without some reason, often attributed to too early rising (third or fourth day) after childbirth and the early violent increase of intraabdominal pressure and vaginal traction while the enlarged puerperal uterus is still in postpartum retroversion and while the parametric (ligamentous) involution is still incomplete.

One cannot but feel that the application of forceps, (so common in this country) if applied before the os is dilated, is to blame for much irreparable tearing and weakening of the parametric tissues as well as the lacerations of the cervix, opening up the way for an "infection" weakening of these tissues as stated under primary prolapse.

The author believes from intraabdominal observation that in many multiparous women with very long intestinal mesenteries the intraabdominal pressure as a causative factor is far in excess of that generally conceded.

Indeed with a weakened parametrovaginum the increased action of the intraabdominal pressure in these cases is probably a not uncommon factor in pushing the entire upper portion of the pelvic floor as a whole down to a lower level even when no prolapse has as yet occurred.

Again it is not uncommon after the menopause to find the senile atrophied and shortened uterus till then anteverted, apparently dragged down by the senile atrophy of the paratissues and shortening of the vagina.

It would also appear as if the senile shortening of the uterus allowing less length of surface for intraabdominal pressure to act upon, was at least in part responsible.

Lastly the power of vaginal traction as a factor in prolapse is well shown in those cases where the uterus is fixed in the pelvis, *e.g.*, by adhesions or tumor or other cause; by the traction on the cervix by the "celic" vagina resulting in a *true elongation of the cervix* while the corpus and fundus uteri remain at, or nearly at, the normal level in the pelvis.

In these latter the anterior vaginal wall traction has its effect mostly upon the intermediary cervix with but little deepening of the vesicouterine culdesac while the *posterior vaginal wall* traction being principally on the supravaginal portion of the cervix drags the Douglas' peritoneal sac down with it.

People's Gas Building.

MESENTERIC CYSTS.*

CLINICAL REPORTS

BY
C. G. CHILD, JR., M. D.,
New York.

PATHOLOGICAL REPORTS

BY
L. W. STRONG, M. D., AND E. SCHWARTZ, M. D.,
New York.

(With One Illustration.)

The following cases admitted to Dr. Goffe's service at the Woman's Hospital last year presented so many points of interest both in regard to the diagnosis and treatment that they are reported in full.

CASE I.—The patient, Mrs. E. C., thirty-two years of age, was born in the West Indies, where she had always resided up to two months before admission. Her father and one sister were both epileptics. This sister finally died in an asylum. Mother alive and well. Her previous history was uneventful. She had had none of the diseases of childhood, nor had she ever been seriously ill in her life.

Previous History.—Menstruation, began at the age of fourteen, regular every twenty-eight days, of three days' duration, moderate in amount, with only slight, if any, pain. The last regular menstruation took place three weeks before admission to the Hospital. She was married at the age of twenty-seven, and had given birth to three children by normal deliveries. She had one accidental miscarriage at three months. No venereal history could be elicited, nor any diseases of childhood. She had always been in extremely good health and had never had any surgical operations.

Present History.—On the twenty-first day of July the patient was seized with sudden sharp and continuous pain in the hypogastrium, followed in a few hours by marked distention and vomiting. There had been no movement of the bowels for thirty-six hours previous to the onset of this attack, nor did any movement occur until an enema was given on her admission to the hospital. This enema was only successful in moving a small amount of fecal concretions from the colon. On admission to the hospital July 24, at 8 in the evening, temperature was 98.2, pulse 120, respirations 22; occasional vomiting, eructations of bile-stained fluid present with no fecal odor; the abdomen markedly distended and tender. Rigidity was extreme but no tumor mass or hernia could be made out because of the distention. Pelvic examination showed old laceration of the perineum, bilateral laceration of the cervix. The uterus was small, retroflexed, immobile behind a large cystic tumor which filled the pelvis, rising up into the abdomen, only slightly movable, and very painful upon examination. Blood examination showed a white cell count of 13,200, differential 79 per cent. The patient was in an extremely weak condition on admission, but in the next two days had improved so much that, after consulting with Dr. Dougal Bissell, we decided upon an immediate operation, making a provisional diagnosis of "ovarian cyst, with twisted pedicle, pelvic peritonitis and probable intestinal obstruction from pressure and adhesions."

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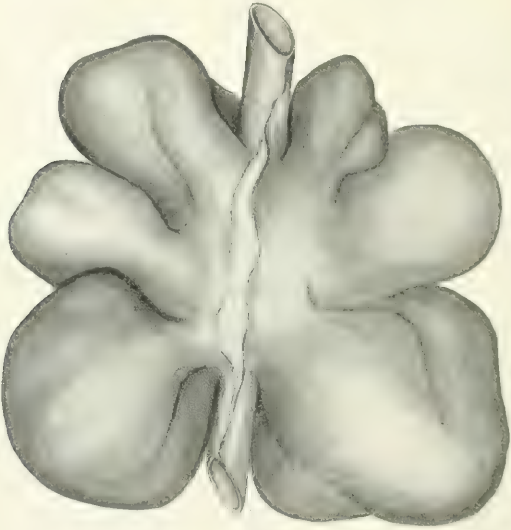
* From The Woman's Hospital, New York City.



CASE I.

On July 26, 1912, I opened the abdomen, making a Pfannensteil incision 6 inches in length midway between umbilicus and symphysis pubis. There were many recent intestinal and omental adhesions to the abdominal wall and to each other. As these were separated, a view of the pelvis disclosed an inflamed cystic tumor adherent in and filling the entire pelvis, excluding any sight of the pelvic viscera. The tumor was easily released from its bed in the pelvis after separating the adhesions by blunt dissection. It was then found to be composed of two cavities, lying on either side of a section of small intestine, intercommunicating through the mesentery, from which the growth probably sprung. These two cyst cavities were so distended as to compress and completely flatten out the section of small intestine between them. On the proximal side the intestine was distended with gas, and on the distal side was collapsed. Upon freeing adhesions at this side and separating the two cysts, the pressure on the intestine was relieved, and the gas passed from the proximal to the distal portion of the gut. The condition seemed to warrant removal, with resection of the involved intestine, which, as the patient was standing the operative proceeding very well, was carried out. Anastomosis was accomplished by means of Murphy button.

Inspection of the pelvic viscera now showed a small uterus which had been crowded posterior by the tumor. The appendages were normal, though small, both ovaries being minute in size.

Peritoneum was closed with a continuous suture of fine kangaroo tendon, fascia and skin with continuous mattress sutures of silkworm-gut.

The convalescence of the patient was uneventful. A maximum elevation of temperature to 103.8, with pulse of 152, respiration 26, occurred on the fifth day. On the fourteenth day temperature became normal, pulse 114 and respiration 22. The wound united by primary union; the sutures were withdrawn at the end of the second week, at which time the patient was allowed out of bed.

She was discharged from the hospital two weeks later, and went to work. Her condition has continued to improve, and she has gained considerably in weight.

An *x*-ray taken one month ago showed the Murphy button still retained. So far as it is possible to learn, however, this has caused her no unfavorable symptoms.

Growths of the mesentery may be solid or cystic. Cysts are the more common, and are either serous, chylous, hemorrhagic, hydatid or dermoid. Little is known of the etiology of these. Some are congenital, and many exist for a long time before they are recognized. Age and sex seem to be unimportant factors.

The diagnosis is always difficult, and the question of interference or noninterference is the principal one to be decided. The subjective symptoms are not distinctive. Pain is the most important. Obstruction and volvulus may occur, but are uncommon. The most valuable signs are relative to position and mobility. These tumors lie either in the middle line or to one side of the large bowel. Free mobility is a most important sign which they exhibit to a greater extent than most other abdominal tumors. This free range of mobility, however, may be much restricted by adhesions resulting from inflammation and by the large size of the tumor itself. When the tumor can be shown to be separated from the solid viscera, the diagnosis becomes easier. It is rarely possible to make out a decidedly outlined cyst wall, as the intestine is frequently intimately adherent to its surface, and broken notes are liable to vary at different times of examination. The pelvic tumors offer at times the greatest difficulty in this respect, and of these the ovarian cysts give the most trouble. If the mesenteric cyst is not adherent in the pelvis, examination in the Trendelenburg position will be of help.

The prognosis depends largely on the character of the growth, and the existence or non-existence of complications. In the operative removal, resection of the intestines adds greatly to the mortality, and should be avoided whenever possible. These cysts seriously endanger life, and should be operated upon at once. Occlusion of the stretched and flattened intestine may take place at any time, and death result if the obstruction is not promptly relieved.

Case II.—This case, one of abdominal cyst of uncertain origin but of much interest, was operated upon in the hospital June 25, 1912, by Dr. J. Riddle Goffe, to whom I am indebted for the following data:

The patient, Mrs. K., was admitted to the hospital on June 23, 1912, complaining of pressure symptoms in the pelvis and lower abdomen. She had had a previous operation in June, 1910, at which time the uterus, showing multipolar fibroid myomata, was removed, together with the right tube and left tube and ovary.

On physical examination the patient showed a large fluctuating movable abdominal tumor, evidently of fluid consistency situated in the lower abdomen.

At operation on June 25, 1912, the abdomen was incised, opening directly into the cyst which contained thin clear fluid. It was apparently so densely adherent to the abdominal wall and to the viscera in all directions that no attempt was made at removal. A portion of the cyst wall, however, was resected for microscopical examination. The cyst cavity was drained with gauze for seven weeks, when spontaneous closure of the sinus occurred.

To date patient has been in excellent health, and presents no evidence of any return of the tumor.

PATHOLOGICAL REPORT.

Case I.—A cyst with a portion of small intestine on the wall, the cyst measuring 15 cm. in greatest diameter, and the intestine measuring 10 cm. in length. The whole cyst wall is hemorrhagic and seminecrotic, it springs from the mesentery near the origin from the parieties and extends forward having the compressed intestine between its two lobes.

The cyst is composed of several chambers incompletely divided by septa, and there is a communication between its right and left lobes behind the intestine. The contents are thin, foul, necrotic material; the inner wall is also hemorrhagic and necrotic.

Microscopic examination of numerous sections of the cyst wall in its thickest parts shows a fibrous connective tissue which merges into the areolar and adipose tissue of the mesentery. The whole is diffusely hemorrhagic and infiltrated with pus and fibrin. There is no trace of epithelium, endothelium, glandular structures or large lymphatics to determine the origin of the cyst.

Case II.—Pieces of a cyst wall measuring approximately 15 cm. in diameter, the pieces measuring from 1 to 3 mm. in thickness and being composed of dense fibrous tissue. The outer surface is hemorrhagic and the inner is covered with a thick, yellowish-white material. A quantity of this material, representing the contents of the cyst, were received separately and the total amount was reported to have been over a liter. Chemical analysis showed the material to be fat with a slight amount of amorphous residue.

Microscopic examination of numerous sections of the cyst wall show it to be composed of connective tissue which has undergone extensive hyaline degeneration and round-cell infiltration. There are no traces of epithelium, endothelium, muscle fibers or lymphatics to determine the origin of the cyst.

Microscopic examination of the cyst contents shows fat globules of varying size, no crystals, no cells.

The origin and classification of mesenteric cysts, of which these are two examples, have been variously given. The term mesenteric cyst is faulty, since it refers only to site without regard to source, and actually includes some cases not properly grouped here. Thus echinococcus cysts, although occurring in the mesentery, should be classified as parasitic while dermoids should be classified as dermoids whatever their location.

Colmers classifies mesenteric cysts with epithelial lining as dermoids, teratoids, cysts with fetal inclusions, urachus cysts and enterocystomata.

The first three groups of Colmers present no fundamental distinction and may be classed as one, namely, dermoids. In addition to Colmers' types are the cysts originating from the lymph system, classified as either lymphangiomata or as chylous cysts corresponding to the two systems of lymph vessels.

Inflammatory cysts are also met with, the histogenesis of which may be confused with cysts of any other type, which have become secondarily inflamed with destruction of their elements. Blood cysts also occur, traumatic or inflammatory. Other classifications have recognized serous or hemorrhagic cysts. This does not indicate a distinction as regards the type or origin, but simply an accidental difference in the contents.

Dowd's classification of mesenteric cysts gives all of them, except echinococcus and malignant, an embryonic origin. He derives them from Wolffian rests similar to parovarial tubules. This idea does not recognize the distinction between heteropy and true embryomas. The former *are* misplacements of one variety of embryonic tissue which later form a new growth. The latter are triphyllic in origin, though only one layer may be present in the tumor. Dowd classified not only all heteropic and embryonal forms as one but also includes enterocystomata and cysts of lymphatic origin under embryomata.

Most probably tumors of lymphatic origin and the enterocystomata, cysts of Meckel's diverticulum (Roth), are of postfetal origin. The presence of the remnants of the ductus omphalomesentericus, Meckel's diverticulum, is abnormal and the development of a cyst from these as may occur later cannot be described as embryonal.

This explanation of the origin of the enterocystomata (Roth, 1881) accounts for most of the cysts held by Dowd to be Wolffian. That there may be other mesenteric cysts of Wolffian origin cannot be denied. These would be analogues of paroophoral cysts. One of the most carefully discussed cases of this kind Niosi (*Virchow's Arch.*, 1907) proves however to be a teratoma.

The difficulty of proving a Wolffian origin in any case of a cyst occurring in a region where Wolffian remnants are not normally present is great. Histological features of Wolffian remains are too vague for exact diagnosis which depends both on locality and histological findings. Adenomyomata, both in locality and histology suggesting Wolffian remains, have not always that origin.

Excluding then from mesenteric cysts, dermoids, echinococcus cysts, urachus cysts, which latter are distinct from their inclusion in the anterior abdominal wall, malignant cysts and hematomata, we have left enterocystomata and lymphatic cysts. These two latter types should be designated enterocystomata or lymphatic cysts whenever their histological features justify it in order to limit as far as possible the faulty designation of mesenteric cyst.

The first exact description of enterocystomata was made by Roth, who also gave them this name. According to him the enterocystomata is a tumor derived from Meckel's diverticulum. Meckel's diverticulum arises from the ilium in its last 80 to 120 cm. from the iliocecal valve, usually taking origin from the convexity but sometimes near the mesenteric attachment. This distance from the iliocecal valve does not apply to all published cases. Meckel's diverticulum has been found as high up as the jejunum and sometimes quite near the ileocecal valve, sometimes even arising from the cecum itself. This, as well as its origin near the mesenteric attachment, will explain the variety of location of enterocyostomas described by Roth. Enterocystomas frequently showing hourglass form were described by Rogers, Hedinger, Roth, Franklin and others. The characteristic constituents of the enterocystoma are two layers of smooth musculature and an epithelium lining corresponding to that of the covering epithelium. This epithelium is not necessarily columnar but may even be ciliated or stratified as Patzold showed.

The adult type of intestinal epithelium need not necessarily be present in enterocystoma because Meckel's diverticulum is an embryonal structure and its epithelium is first cubic, then ciliated and then stratified. There are cases of enterocystoma in the literature where the muscle-bundle arrangement has been plain and others which have shown Lieberkuhn's crypts and lymphoid tissue. These latter showed no constituents of other germinative layers, excluding them from the dermoids.

The other possibility to be considered in our two cases is the type of cysts derived from the lymphatics. The two lymphatic systems, the lymph vessels proper and the chylous vessels, form two distinct types of cysts, that is, lymphangiomata, simple, cystic and cavernous, and secondly, chylous, from the chylous vessels.

A lymphangioma is a neoplasm, which may be either capillary and larger vessels (simple) or cavernous and cystic according to the degree of dilatation. These are two theories of the origin of lymphangiomatous and chylous cysts, the retention theory of Virchow, Rokitanski and later Wegner, and the primary neoplastic theory with secondary lymph secretion and dilatation (Ribbert).

The extensive anastomoses of the lymph system make retention unlikely. The production of cysts experimentally is not to be expected, since ligation or other obstruction does not reproduce the conditions under which these cysts are formed, namely, a very slow developing and long-continued process. Ligation has been found experimentally to produce edema but not cysts.

The argument that cysts recur after removal if they were due to obstruction is not tenable for that is not the history of retention cysts in general for these grow to a certain grade and then are quiescent.

The fact that multilocular cysts have been found in which one chamber had chylous contents and the other serous or hemorrhagic has no bearing on the manner of formation. This may occur in any mesenterial lymph cyst and it may be a secondary change.

A cyst with an epithelial lining but chylous contents suggests an enterocystoma with a secondary accumulation of chyle. Pagenstecher's case especially suggests this, where mucus occurred as well as chyle.

Ney and Wilkinson's case had an epithelial lining and a constricted portion with a locule on either side of the gut. The latter feature has been observed in several enterocystomata, while the epithelium strongly suggests an enterocystoma. Cholesterin crystals are a frequent constituent of any cyst content, and especially of enterocystomata and do not justify a diagnosis of lymphatic cyst as was made in that case.

It remains to discuss the present two cases with reference to other origin.

Case A. shows no definite signs of musculature in its walls. The hemorrhagic and seminecrotic contents as well as the inflamed and degenerated state of the connective tissue forming the wall would account for the loss of epithelium and possibly for the muscle which may have been present. Cases of enterocystomata without epithelium are described. The fact that smooth muscle fibers cannot be demonstrated is a strong point against the supposition of a tumor derived from Meckel's diverticulum. There are areas of new formation of connective tissue showing that extensive change took place in the original wall. Thus though there are no distinctive signs of an enterocystoma there are also no characteristics of any lymphatic tumor, namely chylous contents, endothelium and especially new formation of any lymphatic vessels. This leaves the question open. We do not believe in its primary inflammatory or traumatic origin, since there are no signs of such a grave inflammation in its surroundings to justify such a diagnosis nor is there any history.

Case B. also shows no epithelium nor does its connective tissue wall give any hint of its origin. We have however its unmistakable contents, entirely chylous, which are quite different from the varying amount of fat globules or cholesterin crystals which may be found in the contents of an enterocystoma or even from lymphangiomas containing chyle. The absence of any characteristic elements in its wall speaks more in favor of the chylous cyst.

It is desirable to briefly refer to omental cysts to establish some degree of relationship to mesenteric cysts. Dowd gives hemorrhage and torsion as factors, thus denoting their inflammatory origin. The term pseudocyst would be more accurate and less confusing to use in reference to inflammatory cysts, whether omental or mesenteric. The possibility of lymphatic cysts in the omentum is not to be denied.

This discussion of the histogenesis and classification of mesenterial cysts in general and the analysis of these two cases from a pathological standpoint is undertaken since these matters have been under a good deal of discussion and are still in some confusion.

From our examination of the literature the number of cases of mesenterial cysts which have been incorrectly classified appears relatively large, and it would appear advisable to base a classification on the histogenesis rather than the locality or contents of the cyst.

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TUBERCULOSIS OF THE KIDNEY.

BY
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TRANSLATED BY
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Payer in 1841 called attention to tuberculosis of the kidney, and Peters in 1872 performed the first nephrectomy for tuberculosis. For a long time after this period, the disease remained within the domain of internal medicine.

In a text-book of 1891 (*Lehrbuch der Chirurgie*), Albert said: "Nephrectomy for tuberculosis of the kidney is an error of the times. Men have been found who would perform this operation."

Tuberculosis of the kidney awakened little interest, because:

1. It was considered a rare condition.
2. It was difficult to diagnose.
3. A successful therapeutic measure for its cure seemed unattainable.

When the newer methods of investigation came into existence, it opened up a field to the surgeon. To-day we have a clear conception of the disease and this knowledge has been materially increased in the last ten years.

Recent investigations have shown that tuberculosis of the kidney is by no means a rare disease. C. Chambers, H. Morris, and Tilden Brown have collected 5,838 autopsies and found 2.95 per cent. of tuberculosis of the kidney. I was able to find in 20,770 autopsies, (Zehn Jahre der Wiener Allgemeinen Krankenhauses), 1893–1902. only 191 cases of tuberculosis of the kidney, that is to say, only 1 per cent. It is very evident that cases of acute or subacute miliary tuberculosis, which occurs in the kidney as in other parenchymatous organs, and which is but a part of a general eruption of the tubercular process, were not included in this number.

According to Küster, 10 per cent. of all those dying with tuberculosis have the disease in the kidney.

Krönlein shows in his statistics that the surgical diseases of the kidney in his clinic include 29.8 per cent. of tuberculosis of the kidney, and Israel says that one-third of all the cases that have pus in the kidney are tubercular.

Küster shows that in his 409 cases operated on for tuberculosis of the kidney 255 were women and 154 men. In 203 operated cases, Albarran found 148 women and fifty-five men. Krönlein had in his own cases, thirty-eight women and thirteen men. Kummell had thirty-five women and fifteen men. These figures would tend to show that women are more often affected than men. Israel calculated that 66 per cent. of tuberculosis of the kidney is found in females.

It seems to me that these statistics show that tuberculosis of the kidney is more often operated on in females than in males. There are several reasons why the disease is more frequently discovered in females than males. We must not forget that with tuberculosis of the kidney symptoms arise which are referable to the bladder. With conditions of this kind, women would go to a gynecologist more often than to a surgeon. The male presents himself first to a syphilographer rather than to a surgeon, because he mistakes his condition for an uncured gonorrhea. I am supported in my view, that tuberculosis of the kidney is more frequently found in the male than female, by a review of ten years' autopsies at the Wiener Allgemeines Krankenhaus. The records show that out of 191 cases of tuberculosis of the kidney, 135 were men and fifty-six women. These statistics show that in fatal cases of tuberculosis of the kidney, the male sex dominates markedly. My own observation shows that out of sixty-two cases of tuberculosis of the kidney, of which thirty-four were operated upon, fourteen were men and twenty were women. Here the operated cases in women predominate.

Among twenty-eight non-operated cases, twenty-two were men and six women. Here we see the predominance of men. This shows that women are mre frequently operated on than men, but the disease is more frequent in men than in women. These statistics would also tend to show that more men die of tuberculosis of the kidney than women, because in women the disease comes to be recognized before a period when an operation is of no avail.

The reason for the late diagnosis of tuberculosis of the kidney in men is due to the fact that it is more difficult to diagnose this condition in them than in women.

As a rule, tuberculosis of the kidney is unilateral (Krönlein estimates it as 92 per cent. and Israel 88 per cent.). In my own sixty-two cases I found forty-eight unilateral and fourteen bilateral. But it is to be observed that in the latter we have good reason to believe that the affection was unilateral at first. Several cases, however, had the disease bilateral from the beginning. Steinthal and H. J. Almar Heiberg have found in 108 grave cases of tuberculosis of the kidney that one-half of these had a normal kidney on one side. Halle and Motz have found in 131 cases that eighty-nine were unilateral.

It is the consensus of opinion that the right kidney is more often affected than the left, particularly in women; a disposition toward tuberculosis on this side perhaps is a result of a more frequent prolapse of the right kidney. Küster finds that in 352 cases the right side was affected 189 times, and the left side 163 times. Krönlein, on the other hand, found tuberculosis of the kidney as frequent on one side as on the other. In my own statistics, I find that in fifty-seven cases the left was involved and in fifty-four the right. From these statistics, we can say

1. That tuberculosis of the kidney is, as a rule, unilateral.
2. That men suffer with it more frequently than women.
3. That it is found on one side as frequently as on the other.

Mode of Infection.—The division of tuberculosis of the kidney into primary and secondary not proven practical. According to Israel's classification, we distinguish: First, the protopathic form; that is to say, cases in which the kidney is the only organ in the body where the tubercular process manifests itself. This form of tuberculosis of the kidney could only be proved on the autopsy table, because healed foci of tuberculosis could not otherwise be excluded in other organs of the body.

Second, the deuteropathic form, that is to say, cases where the kidney is not the only organ affected by tuberculosis. This form can be primary, the kidney being the first organ affected by tuberculosis, in the urinary apparatus—hematogenous infection.

Third, the secondary, that is to say, the kidney is the second point of infection in the urinary apparatus, and is an urogenous infection.

Primary tuberculosis of the kidney, as a rule, is by the hematogenous route (Borrel, Larouch, Baumgarten, and Hansen). It is hardly possible that such an infection could come as a result of filtration of the tubercle bacilli with the urine. From this focus, in the kidney, the ureters and bladder become infected secondarily, either by the urogenous route, by continuity of tissue, or else by the hematogenous or lymphogenous route. The first of these is the usual mode of infection, in the opinion of Halle and Motz.

Against this descending mode of tubercular infection stands an ascending type, in which the kidney becomes secondarily infected from the bladder focus by way of the ureters. In the deuteropathic form, where the kidney becomes secondarily involved, the bladder is the first organ of infection, and it becomes immaterial, whether the bladder becomes infected by the hematogenous route from some distant focus of tuberculosis in the organism, by the lymphatic route from the genital apparatus, or whether the infection came by way of the orificium urethræ internum.

By means of this nomenclature, tuberculosis of the kidney and that of the genital apparatus is entirely separated. The linking together of tuberculosis of the urinary apparatus with that of the genital apparatus has led to much confusion and false interpretation of the tubercular processes in this region of the body.

We frequently find that when tuberculosis of the kidney has existed with tuberculosis of the neighboring organs, the infection of the kidney was considered to be secondary. Believing that the infection has ascended to the kidney, Küster claimed that in tuberculosis of the testicle the lesion in the kidney was the result of an ascending infection. But attention must be called to the fact that in tuberculosis of the neighboring organs and of the kidney, an ascending infection must travel through the intermediary organ, namely, the bladder. Without tuberculosis of the bladder, no ascending infection of the kidney could have occurred. No great importance seemed to have been attached to the lesions in the mucous membrane of the bladder, when tuberculosis of the genital apparatus and that of the kidney existed at the same time. It has been taken for granted that the bladder tuberculosis had to exist.

The fact that tuberculosis of the kidney with bladder symptoms can exist without any lesion within the mucous membrane of the bladder was not known. It has been observed by Israel, Krönlein, Kummell and Kapsammer, that kidney tuberculosis can exist together with tuberculosis in the neighboring organs. For instance, ovarian tuberculosis may exist without involvement of other parts of the urogenital apparatus. There may be a normal prostate, normal bladder and normal ureters. In these cases, it is evident we have to deal with an isolated infection of the kidney, a hematogenous origin. We have one focus in the kidney, another focus in the testicle, or ovary, and no continuity of surfaces can come into question.

The opinion of internists has been that tuberculosis of the kidney is of hematogenous origin, particularly in the later stages of the disease, when both kidneys are involved, and that this tubercular process is part of a general tuberculosis. Gujon also taught in 1888 that tuberculosis of the kidney is an end result of tuberculosis of the bladder or that of the genital apparatus and not a fertile field for the surgeon. This teaching of Gujon prevailed in France, and was also taught by Lanceraut, Cueveilhier, Brissaud, Küssmaul, and Senator. Even in more recent times, the publications of Von Pousson along the same lines had an influence which is plainly shown. Pousson reported in 1905 on thirty-two operations of kidney tuberculosis, twelve of which were of the ascending type. A more careful study, however, of the twelve cases shows that the majority really were of the descending type of tuberculosis of the urinary apparatus. The experiments of Albarran in 1898, Bernard and Salomon in 1904, and Baumgarten in 1905, show conclusively that experimentally an ascending infection of the kidney could be brought about only by the ligatures on the ureters when they are specifically infected. These experiments show the difficulties which are encountered in the ascending type of infection. For an ascending infection to occur, it is not sufficient to have tuberculosis of the mucous membrane of the bladder, but we must also have a bladder insufficiency and an insufficiency of the detrusor. Not only the mucous membrane of the bladder, but also the muscular tissue must be diseased. Constant contraction of the bladder to evacuate its contents results in forcing the urine in the direction of least resistance, which is that of the ureters. In this manner the tubercle bacilli which are in the urine are squeezed into the ureter and infect its mucous membrane. On account of infiltration of the meatus of the ureter, its elasticity becomes lost, permitting a reflux of the urine. Whether the antiperistalsis of the ureters comes into play or not (Levine and Goldsmith) is an undecided question.

Cayla, Elbernard, Halle and Motz are of the opinion that ascending tubercular infection from the urogenital apparatus to the kidney does not exist; but it seems to me these gentlemen have gone too far. I found in sixty-two cases only one where I thought an ascending mode of infection took place (Case 30). Kreissl also observed one case, and seems to be of the same opinion. It is very certain that ascending tubercular infection is a rarity. The rule is, that first a hematogenous infection of the kidney occurs, after which we have a descending infection to the ureters and bladder.

When we discover tubercle bacilli in the urine, our first thought must be to find the kidney from which these bacilli come. In the later stages of the disease, we also find, as a rule, the second kidney involved, which at times is of specific, and at other times, of nonspecific nature.

The specific infection of the second kidney has been observed to occur in two ways. First, the ascending mode of infection from the bladder (Tuffier). This appears to me to be theoretical. At least, definite observations have not been brought forward to prove the occurrence of this mode of infection. Second, the hematogenous route (*a*) by the circulation, (*b*) directly from one kidney to the other under the diaphragm by the "canal veneux reno-capsulo diaphragmatique" (Escat, Albarran and Kathelin). For the hematogenous infection of the second kidney, we must also consider that, on account of long-continued tuberculosis in one kidney, the other kidney becomes diseased on account of the *locus minoris resistentiæ.*

The nonspecific infection of the second kidney takes place in the parenchyma of the organ, but also with changes in the interstitial tissues and is of a toxic nature (Salomon, Perchere). If this nonspecific affection has not extended to a great degree, complete recovery takes place, when the diseased kidney is extirpated.

Pathological Anatomy of Kidney Tuberculosis.—For the knowledge of the pathological anatomy of tuberculosis of the kidney, we have to thank, as has already been mentioned, Albarran and Halle, as well as the clinics of Guyon, Motz, Israel, Krönlein, Tuffier and Pousson.

Excluding cases of miliary tuberculosis, tuberculosis of the kidney can be divided into five forms:

First. Tubercular nephritis. This form of nephritis is recognized clinically as a chronic nephritis, with the appearance of tubercle bacilli in the urine. This nephritis is brought about by the specification of the tubercle bacilli. The lesions are in the epithelium of the kidney, and usually lead to quick death. If interstitial changes are also present at the same time, as a rule, the disease takes a slower course.

A very peculiar type of interstitial tubercular nephritis resulting in cyst formation was discovered by Curtis and Carler.

Tubercular nephritis is to be distinguished from nephritis in the tubercular (Bartels and Lancreant, Bernard, Brault, Buth, Landouzy, Pousson, Payer), a condition which occurs in individuals ill with extensive tuberculosis (d'Argio and Tanayo found this type in 98 per cent. of their autopsies). This same process is also to be found in the neglected cases of one-sided tuberculosis of the kidney, where the second kidney becomes affected. The nephritis in the second kidney is the result of a toxic process and, as a rule, disappears when the tubercular kidney is extirpated (Kapsammer, cases 7, 10, 21, 27). The nephritis shows itself by an albuminuria during the tubercular process, and is not frequently diagnosed.

Second class. The infiltrated form, which leads to sclerosis of the kidney. In this form, tubercles occur throughout the entire kidney substance, accompanied by extensive interstitial changes. So extensive are the changes in this type of nephritis that the characteristic of the entire kidney becomes lost and the organ resembles that of a neoplasm. A case of this kind was reported by Albarran, where, even with the aid of the microscope, it was difficult to differentiate between a sarcoma and tuberculosis of the kidney. The disease rarely comes to a stage of caseation. However, we may often find small foci of calcareous changes. In this type of nephritis, the capsule undergoes an active process of proliferation, and three forms of this change in the capsule can be distinguished. First, the fungoid proliferation, second, the connective-tissue proliferation, and third, proliferation of the fatty tissue of the capsule of the kidney. The proliferation of the fat also extends to the hilum of the kidney and crowds the tissues of the organ to such an extent that its cut surface looks as though the kidney has been invaded by a fatty growth.

Extensive proliferation of the fat may finally lead to changes in the pelvis of the kidney (Kapsammer, cases 4 and 18). To this class belong the three cases of Rapins, where the fatty substance filled up the entire pelvis of the kidney. An extensive fatty proliferation may form tumor-like masses and in one case of Madelung, the entire kidney tissue atrophied from the pressure of the fatty growth.

The opinions are divided as to the pathogenesis of the sclerotic changes in the connective and fatty tissues occurring around the kidney, the pelvis of the kidney and ureters, which leads to perinephritic perpyelitic and periureteric proliferation of tissue.

On the one hand, this condition is considered to be a specific process which, after the tubercles are healed, results in a fibrolipomatous hypertrophy, and takes the character of an ordinary inflammatory reaction (Halle and Motz). Nevertheless it must not be overlooked that we are dealing with a specific reaction. Attention must here be called to the experiments of Bernard and Salomon, who showed that chloroform extracts of dead tubercle bacilli when injected, bring about a fibrinous inflammatory reaction in the tissues of the animal, while after an ether extract necrosis and caseation occurred. It is also to be observed that these excessive connective-tissue and fatty proliferations are to be looked upon as a curative process on the part of nature.

On the other hand, these changes have been thought to be the result of a mixed infection.

Third. Tubercular ulceration of the papilla. This form was described by Israel, having the clinical characteristics of excessive bleeding. However, as isolated cases, this form occurs rather infrequently (Kapsammer, case 23). The condition usually results in a tuberculous pyonephrosis and enlargement of the pelvis of the kidney. As a rule, we find this type in combination with the cavernous forms.

Fourth. Cavernous type. This is by far the most frequent form of tuberculosis of the kidney. Between the medullary and cortical portions, the tubercles break down and become confluent with the formation of a cave. The first caves usually form at the two poles of the kidney, but, according to Israel, the lower pole is the one more frequently affected first. According to my observations it is the upper one. It is very likely that the reason why the poles become affected first is, that there is a direct vessel from the aorta to this region of the kidney, having no communication with the capillaries of the other structures of the kidney. If the entire kidney becomes excavated pyonephrosis occurs with no enlargement of the pelvis of the kidney. As a rule, the cave becomes lined by specific granulation tissue which undergoes caseation under rare conditions. However, the walls of the cave may be lined by a necrotic diphtheritic-like membrane.

Not infrequently, we may find two or three isolated tubercular caves in the kidney structure or an isolated abscess cavity, but the rest of the parenchyma of the kidney is undergoing an inflammatory reaction accompanied by a process of contraction.

In some cases, late in the disease, the excavations may take on the appearance of a cyst on account of the liberation of caseous masses.

Fifth. Tubercular Pyonephrosis. A good many of the tubercular processes that occur in the kidney finally lead to tubercular pyonephrosis, particularly the cavernous forms, where, however, no dilatation of the pelvis of the kidney may exist. The end result of the papular form is also a pyonephrosis. Here the papilla and pyramids disappear and the pelvis of the kidney becomes enlarged at the expense of the parenchyma. If the kidney structure is markedly destroyed, the whole kidney becomes one large pus sac. The enlargement of the pelvis of the kidney is, as a rule, secondary. When the ureters are not obstructed, it is the result of the destruction of the kidney substance.

Tubercular pyonephrosis can also occur when there is an obstruction to the flow of urine. Damming back the urine leads to dilatation of the pelvis of the kidney. As a result of this backward pressure of the urine, the kidney substance undergoes atrophy. If a tubercular focus is present in the kidney, tubercle bacilli will pass down the ureter, and it is clear that tubercle bacilli will accumulate in those regions of the ureter where there is a physiological narrowing, namely, at the pelvis of the kidney and at the entrance of the ureter into the bladder. Active inflammation then proceeds, which results in a stenosis of the ureter. The urine causes distention of the pelvis of the kidney, a uronephrosis, which finally results in a pyonephrosis.

It is not really necessary to call attention to the fact that the forms of tuberculosis of the kidney enumerated above can occur in combination with other diseases of the kidney and it is to be observed that a mixed infection is not of infrequent occurrence in tuberculosis of the kidney and furthermore, cases are also found where, with tuberculosis of the kidney stone formations are found as well as neoplasms.

TUBERCULOSIS OF THE PELVIS OF THE KIDNEY AND URETER.

A specific tubercular infection of the ureter or pelvis of the kidney, without the presence of tuberculosis of the kidney or bladder, has, so far, never been observed. Tuberculosis of the pelvis of the kidney and ureter is a result of a specific disease in the other parts of the urinary apparatus, and, as a rule, the result of a primary tuberculosis of the kidney. The manner in which this infection occurs is threefold

First. Urogenous infection; the tubercle bacilli in the urine from the diseased kidney becomes implanted in the mucous membrane of the pelvis of the kidney and ureters. This is by far the most frequent mode of infection, which leads to lesions in the mucous membrane of the lower portion of the ureters, and there may be an intact mucous membrane in the upper portion.

Second. The infection may spread by continuity. The process is simply an extension of the disease from the kidney into the ureter by way of the pelvis. This is, as a rule, a slow process and is rather the exception in the mode of spreading of the disease. As a rule, the spread of the process is by leaps and bounds in a downward direction, as is the case with the urogenous mode of spreading.

Third. Hematogenous and Lymphatic Mode of Infection. This is by far the most infrequent and serves to designate that class where there is a marked periureteral tuberculous change, with very slight tubercular lesions in the mucous membrane (Pousson).

A very peculiar class includes those cases where, in the presence of a specific tubercular lesion in the kidney, the disease in the ureters is not of a specific type (Gotzl). These facts seem to me to be of great prognostic importance, because it is my opinion that these are the cases of ureteritis and cystitis that are cured after the extirpation of the tuberculous kidney, without local treatment. These nonspecific affections of the ureter and bladder are the ones about which the opinion has so many times been expressed, that with the extirpation of the diseased kidney, the tuberculosis of the bladder, as a rule, heals spontaneously. According to our present view of condition, we must not be misguided, but after the nephrectomy for tuberculosis, we should treat the remaining ureter and bladder by local applications.

The tubercular disease of the pelvis of the kidney and ureter may confine itself entirely to the mucous membrane or the entire wall may be involved, or the disease may even spread to the neighboring connective tissue.

The tuberculosis occurring in the mucous membrane takes on the form of isolated or confluent tubercles, which have a tendency to undergo caseation with the formation of specific tubercular ulcers (Kapsammer, case 30). Or massive plaque-like infiltrations may be formed which may end in a cavernous type. In this later form, the ureter is often dilated in various places. These ampulla-like dilatations are explainable on the basis that in the beginning, with the obstruction of the ureters, the walls gave way under pressure, while those regions that have become infiltrated by the tubercular process withstood this pressure. On the other hand, these dilatations are explainable in the later stages of the disease by the thickening of the wall of the ureter, as the result of inflammatory reactions.

As a result of the tubercular process and swelling, an absolute obliteration of the ureter can come about, which, however, has its advantages, when the obstruction occurs in very slow stages, as it brings about a painless separation of the tubercular kidney from the rest of the organism.

The changes in the wall of the ureters consist in a specific infiltration, which frequently leads to stenosis of the lumen.

The periureteral changes, as in the pelvis of the kidney, are seldom of a fungoid nature. As a rule, like in the pelvis, it is here of the nature of a fibrolipomatosis, which changes the ureters to sausage-like structures, palpable through the abdominal walls. With this fibrolipomatous proliferation as well as with the specific infiltrations of the wall of the ureter, there is a great tendency to contraction. This fact may be verified by the cystoscope, showing the mouth of the ureter drawn up into a crator-like excavation.

Symptoms of Renal Tuberculosis.—The symptoms of tuberculosis of the kidney arise (*a*) from the kidney; (*b*) from the ureters; (*c*) from the urine; (*d*) from the other organs.

In classes (*a*), (*b*), and (*d*), we have to differentiate the subjective and objective symptoms.

(*a*) *Subjective Symptoms on the Part of the Kidney.*—In advanced cases of tuberculosis of the kidney, or even in the presence of a pyonephrosis, where the ureter has become closed in a gradual manner, symptoms on the part of the kidney may be entirely absent. This fact is responsible for the circumstance that in these cases neither the patient, nor the physician who is treating the patient, has the slightest thought of the possibility of the existence of the disease in the kidney.

Frequently the only symptom present is a dull ache in the lumbar region, which is independent of any movements, but which is felt on reclining on the back or while warm under the bed covers, or in women becoming exaggerated during the menstrual periods. Frequently, however, even in the early stages of the disease, the patient may experience attacks of severe pain, although the urine shows no changes. These symptoms are mostly in those types of renal tuberculosis where there is a marked change in the capsule of the kidney, and where inflammatory reaction sets in in the perirenal connective tissue. The pains sometimes radiate from this region to the shoulder-blade, toward the other kidney, and downward toward the bladder.

(*b*) *Objective Symptoms Referable to the Kidney.*—Enlargement of the organ is referable only to the later stages of the disease, and yet even a greatly diseased tubercular kidney may not only be not enlarged, but be diminished in size. Again, an enlarged kidney from pyonephrosis may be so compressible as to escape palpation. In the early stages of the disease, as a rule, there is no enlargement of the kidney.

An error in the diagnosis of tuberculosis of the kidney may occur even though we feel the enlarged kidney and the urine contains tubercle bacilli, if we were to rely on these symptoms alone.

Furthermore, both kidneys may be enlarged, one from a tubercular disease, and the other from a compensatory hypertrophy.

It may happen that the kidney hypertrophied by compensation is the one that is painful to the touch. Reliance on palpation may lead to error, and an error in operations has occurred where the good compensatory kidney was removed by mistake, resulting in the death of the patient. Then, again, palpation may reveal an enlargement which is due to a much thickened capsule and not to the kidney. Under these conditions, the kidney may even be much smaller than normal.

Sensitiveness to touch may be absent in tuberculosis of the kidney, even in very advanced cases. In other instances, again, there is great sensitiveness to touch and palpation may be absolutely impossible on account of the rigidity of the muscular structures from a reflex action on part of the diseased kidney. In another case, again, there is excessive pain from pressure, due to inflammatory infiltration of the capsule of the kidney. Even this symptom may be misleading, because sensitiveness to pressure and pain may be referred to the kidney which is undergoing a compensatory hypertrophy, while the kidney which is the seat of tuberculosis remains insensitive to the touch.

Symptoms Referable to the Ureters.—(*a*) Subjective symptoms referable to the ureters, as a rule, are those of pain, but it is not of frequent occurrence. If periureteritis occurs, pain can be elicited on pressure. If an acute closure of the lumen takes place, the symptoms will simulate those of nephrolithiasis. While a gradual obstruction of the lumen of the ureter in tuberculosis of the kidney will give little or no subjective symptoms, a sudden obstruction will give rise to most stormy symptoms. The pains radiate toward the kidney, toward the bladder, toward the labia in the female or the glans in the male. They may radiate toward the shoulder-blade accompanied by chills and vomiting. Tuberculosis of the kidney has also been observed where frequent attacks of colic were experienced by the patient, and a knowledge of such conditions is of utmost importance, because very frequently a mistake might be made in diagnosing such a nephrolithiasis, and the patient advised to take some cure in a watering place, a treatment contraindicated in tuberculosis of the kidney. Bazy claims that if subjective symptoms of pain are elicited in the bladder or rectum, when the mouth of the ureter is touched, it speaks for tuberculosis of the ureter on the corresponding side.

(*b*) *Objective Symptoms Referable to the Ureter.*—In females it is frequently possible to palpate a thickened ureter and, in some cases, the thickened ureter may be palpable through the abdominal wall, giving the sensation of a sausage-like structure.

(*a*) *Symptoms on the Part of the Urinary Bladder.*—The most frequent subjective symptom of tuberculosis of the kidney on the part of the bladder is a frequent desire to urinate, which may increase to such an extent as to throw the organ into a continuous cramp, and lead to a complete incontinence of urine.

i. This bladder irritability may exist even in cases where there is no involvement of the mucous membrane in the bladder. In these cases we have to deal with a diseased ureter which affects the bladder reflexly.

ii. It is known that bladder irritability may also occur from a diseased condition of the organ, which is not tubercular. As a rule, nontuberculous cystitis is found in the cases where the bladder recovers after nephrectomy without any local treatment.

iii. As a rule, frequent contraction of the bladder depends upon the tubercular process in the organ. In the advanced cases of bladder tuberculosis the disturbances of function of the detrusors and sphincters is so great that there is a desire to empty the bladder every few minutes, accompanied by a great deal of bearing-down pain, which may amount to complete incontinence. In these cases, the bladder will not tolerate any instrumentation for diagnostic purposes, thereby making it difficult to arrive at a definite diagnosis. The greater our knowledge of tuberculosis of the kidney and bladder, the less frequent will we find cases of this kind that have advanced to such a point as to make every instrumentation impossible.

iv. On the other hand, there are cases of tubercular cystitis, as well as nonspecific cystitis, where every subjective symptom on the part of the bladder is missing.

(*b*) *Objective Symptoms on the Part of the Bladder.*—In the greatly advanced cases, infiltration of the bladder wall may be so extensive as to constitute a tumor which may be palpable through the rectum or even through the abdominal wall. Ulcerations exist on the mucous surface, which lead to pyuria and hematuria. These ulcerations on the neck of the bladder may simulate conditions that are seen in gonorrheal processes.

Symptoms Referable to Urine. 1. *Polyuria.*—In tuberculosis of the kidney, polyuria is a characteristic symptom, and in cases with clear urine, it may be an early symptom of the disease. As a rule, the polyuria is more marked during the night. The increased quantity of urine may be a sign that interstitial nephritis also exists and is accompanying the tubercular process. The polyuria may be an indirect result of the frequent contraction of the bladder, which, interfering, as it does, with proper ureter peristalsis, dams back the urine into the pelvis of the kidney. This damming back of the urine results in pressure atrophy of the pyramids, causes polyuria by interfering with the mechanism of reabsorption of the watery elements of the urine. A similar condition is seen in cases with prostatic disease.

2. *Albuminuria.*—Albuminuria is a frequent symptom of tuberculosis of the kidney, but is found in a mild degree, even in the later stages of the disease, although extensive lesions may be present in the kidney. We must, however, differentiate between an albuminuria occurring in tuberculosis and an albuminuria in tuberculosis of the kidney. Albuminuria with no specific glandular involvement, is a frequent symptom of tuberculosis, and it is supposed to be a result of a toxic state; the albumin coming from both kidneys. In tuberculosis of one kidney, the albuminuria present is also of a toxic nature, the second kidney not suffering with a specific disease. An albuminuria of this kind, disappears after the tubercular kidney is removed and does not stand in a direct relation to the extent of the disease of the kidney. In very extensive destructions of the kidney, only a moderate amount of albumin may be found in the urine. In the later stages of the disease, as well as in the beginning, albumin in the urine may be entirely absent.

3. *Pyuria.*—Pus in the urine is regularly found in tuberculosis of the kidney. Sometimes the pus found is very small in quantity, even in those cases where extensive excavations have occurred in the parenchyma of the kidneys. This mild degree of pyuria is often overlooked, both by the patient and by the physician. Of great significance is the frequent occurrence of turbid urine due to the presence of pus. The frequent occurrence of the turbidity of the urine is a characteristic symptom of tuberculosis of the kidney, and various reasons have been given for these attacks. It has been said that when the excavations in the parenchyma of the kidney becomes filled with pus, it breaks into the pelvis of the kidney, with the result that

the urine becomes turbid; but it has also been found that the excavations in the parenchyma of the kidney may communicate and drain freely into the pelvis of the kidney, and yet, periodic turbidity of the urine may occur. The position of the patient, whether a horizontal or vertical, seems to play a rôle also.

Another reason for the periodic cloudiness of the urine may be found in the conditions of the urinary passages. Tuberculosis of the kidney is, as a rule, unilateral. As a result of the tubercular process, the ureter becomes involved and closure of its canal may occur. During the ureter obstruction, the flow of urine is only from the normal kidney, which may be only slightly cloudy or even absolutely clear. In this way, a natural separation of the two urines, comes about.

4. *Hematuria.*—Hematuria constitutes one of the more infrequent symptoms of tuberculosis of the kidney and is more frequently encountered in the beginning of the disease than in later stages. In the beginning of the process, while the urine is still clear, severe hemorrhages may occur, which may jeopardize the patient, and call for an immediate nephrectomy, before the disease is diagnosed. Cases of this kind have been reported by Albarran, Cole, Habershon and Kapsammer.

A great many of the so-called "Essential Hematurias" are, in reality, tuberculosis of the kidney. How easily an error may be made, in reference to this matter is shown in one of my cases (case 29), also in one of Braatz. In this case, on account of continued hemorrhages lasting fourteen days, a nephrectomy was performed. The kidney looked perfectly normal in every way, but on section, two little tubercles were observed as large as millet seeds, which were typical. Besides these two minute lesions, a histological examination revealed an interstitial nephritis and hemorrhages in the wall of the pelvis of the kidney. How easy it would have been to overlook in this kidney, the two minute tubercular foci. In a case of this kind, in order to find these small foci of tuberculosis, it would be necessary to make serial microscopic sections, in order to find these minute lesions, a histological study which has never been done. In the case of Braatz, at the first operation, the kidney was opened and as no pathological lesions were discovered, the kidney was not removed. On account of the continued pain, a nephrectomy was finally performed which on section, showed tubercular foci on one pole of the kidney, which had escaped detection at the first operation. There were also other new foci of the disease and atrophy of the front part of the kidney.

Cases of this kind show that foci of tuberculosis can be overlooked, even during the operation, and the cases called "essential hematuria" or unilateral nephritis, when in reality, the condition is one of tuberculosis of the kidney.

The abundant hemorrhage in the case above reported was not from the focus of the disease, but it was probably the result of congestion of the kidney, due to tubercular nephritis. We find analogous conditions of hemorrhages from congestion in tuberculosis of the lungs.

In the advanced stages of tuberculosis of the kidney, hemorrhages occur seldom, so that if we have a pyuria to deal with, accompanied by periodic hemorrhages, we should suspect a renal lithiasis, rather than a renal tuberculosis.

By far the greatest number of cases of tuberculosis of the kidney, even those that terminate fatally, show no hematuria visible to the naked eye.

5. *Phosphaturia.*—In kidney tuberculosis, the acid reaction of the urine is pathognomonic. If we have pyuria with alkaline reaction of the urine our first thought is not that of tuberculosis of the kidney. There are cases, however, of tuberculosis of the kidney, where an alkaline reaction exists with phosphaturia not only in the advanced cases, with mixed infection, but also in the early part of the disease. Whether this phosphaturia stands in some relation to the disease or is the result of drinking a great deal of alkaline mineral waters in the beginning of the disease on account of a mistaken diagnosis, it is impossible to say.

D. Symptoms on the Part of Other Organs. 1. *The Heart.*—The heart seems to show no changes as the result of the chronic process which is taking place in the kidneys even in lethal cases. As a rule, no hypertrophy on the part of the heart has been observed and the blood pressure of tuberculosis of the kidney is low.

2. *Fever.*—Fever is considered a characteristic symptom of tuberculosis of the kidney (Senator), but as the result of observation, I came to the conclusion that fever is relatively infrequent in tuberculosis of the kidney. In the later stages of the disease, evening temperatures do occur, but we see cases of tuberculosis of the kidney with extensive pyonephrosis without the least temperature. Long-continued and high temperature is a sign of mixed infection with bacteria coli, staphylococcus and streptococcus.

3. *Night Sweats.*—Night sweats speak more for a general tuberculosis than for a specific tubercular localization in the kidney.

Diagnosis of Tuberculosis of the Kidney.—Tuberculosis of the kidney belongs to those diseases which up to recent times, were rarely diagnosed. In 191 cases that I was able to collect from ten years' records of autopsies (Allgemeines Krankenhaus), only two cases were properly diagnosed, four were wrongly diagnosed, and 185 were not diagnosed at all. Of the 185 cases, sixty-seven were found to be on one side only.

As the first symptom, and in a great many cases the only symptom, of tuberculosis of the kidney is difficulty with the bladder, so as a rule, patients are treated for bladder catarrh for many years, until they die of kidney tuberculosis, which the physician believes was due to an extension of the disease from the bladder. In reference to this disease a great change is necessary in our treatment. While no physician would think of treating a long-continued hoarseness without a laryngoscopic examination, it is not so with the bladder, as many a physician treats a case of chronic bladder disease without thinking of a cystoscopic examination. In reference to this, Hollander spoke characteristically in 1897. He says that "when complex symptoms were present referable to the bladder, the cystoscope often brought assurance, and this method of investigation is not necessary in all cases of bladder catarrh, but only those cases where treatment seems to be of no avail." It seems to me, that this process should be reversed, that in bladder affections a positive diagnosis should first be made in every case by every known method and then to proceed with the treatment of the case. Israel, 1901 said in reference to the diagnosis of kidney tuberculosis, "The diagnostic difficulties secondly are, that in the majority of cases, the patient does not think of his kidney as the seat of the trouble, but only the bladder, and the physician promptly supports this view with the diagnosis of catarrh of the bladder. Frequently the urine is cloudy and as the examiner knows that cloudiness of the urine occurs in catarrh of the bladder, the diagnosis is still further confirmed."

At present, many of the patients coming to the hospitals for the treatment of this disease appear only after years of suffering and with bladders in such a condition as to make a cystoscopic examination impossible. Our line of procedure with these cases is, as follows:

First, to prove the specific character of the disease and second, to determine the seat of the disease.

First, to prove the specific character of the disease, it is necessary to prove the presence of tubercle bacilli. This is accomplished in one of three ways. First, by the microscope, second, by animal experimentation, and third by culture. All authors agree that the demonstration of the presence of tubercle bacilli microscopically is a difficult process and can only be elicited in a very small number of cases. A most curious circumstance is the report of Kummell, of 1905, where he claims to have demonstrated microscopically the presence of tubercle bacilli in every one of his cases. In some of the latent cases the bacilli are so few in number that they cannot be demonstrated even in the tissues.

In 1891, Steinbeck called into use the centrifuge. This method of investigation for the finding of tubercle bacilli in the urine had many advantages and was endorsed by Litten and Jaksch. Later, Forsell centrifuged the sediment of many liters of urine and hoped thereby to simplify the matter. Later again, Kirstein, Sehlem and Wendriner endeavored to further endorse and simplify the demonstration of tubercle bacilli by the microscope.

In tuberculosis of the urinary apparatus, it is impossible to mistake microscopically, Koch's bacillius with the acid-fast smegma bacillus, which are found even in the normal urethra. In the female, more frequently than in the male, smegma bacilli have been found even in the urine drawn with a catheter. These two acid-fast bacilli are differentiated in the following manner.

1. Microscopically, Koch's bacilli differ from the smegma bacilli in that the ends are not so even. They frequently lie in "S" shaped groups, also in "X" shaped groups, and as a rule, other bacilli are wanting. The smegma bacilli are thicker than tubercle bacilli, they lie scattered over the microscopic field, and, as a rule, other bacteria are also present. They resist acid and alcohol but slightly.

2. A positive tubercular reaction in the animal tested proves unmistakably the presence of tubercle bacilli, but a negative reaction in the animal does not necessarily mean an absence of the disease.

In animal experimentation, there are three modes of procedure.

First, intraperitoneal vaccination, which in my experience, as a rule, proves successful.

Second, intraocular, which brings about a panophthalmitis, and

Third, subcutaneous vaccination in the inguinal region, brought to our attention by Salus in 1903. This later method has the advantage of not bringing about a caseation in the inguinal glands, while with the intraperitoneal method, the acid-fast bacilli other than the Koch bacilli may cause caseation in the intraperitoneal glands. Bloch has recently attempted to bring about a quicker result in the enlargement of the inguinal glands by traumatizing the glands at the time of the injection.

The next question in reference to this subject is this, does the presence of tubercle bacilli in the urine positively prove the presence of tuberculosis of the kidney?

In spite of the presence of tubercle bacilli in the urine there have been a few cases reported, where no specific tuberculosis of the removed kidney was demonstrated, but instead, there was a neoplasm present, pyonephrosis or chronic nephritis, and the pathological and anatomical appearances were not those of tuberculosis of the kidney.

In reference to neoplasm, we must be reminded of the experience of Albarran, who even with the aid of the microscope was unable to make a differential diagnosis between a sarcoma and tuberculosis. As with an ordinary nephritis, so it is also with a kidney harboring a neoplasm, only a serial section of the organ could positively exclude the presence of a tubercular focus in the kidney. In pyonephrosis, as a result of a long-continued mixed infection, every sign of the tubercular process may have disappeared. Bernard and Salomon have shown that the tubercle bacilli can bring about a specific type of a chronic nephritis, that is to say, a specific tubercular nephritis, which can be differentiated from a nephritis caused by other toxic substances, by the presence of the tubercle bacilli. de Arigo and Tamayo have confirmed this observation by demonstrating the presence of the tubercle bacilli in the tissue of these cases, ninety-five times in 110 cases. When Foulerton, Rillier, Fournier Jousset, Huster and Sherrington came to the conclusion that in tubercular individuals, tubercle bacilli may be present in the urine without having specific lesions in the kidney, they based their conclusions upon not finding tubercles in the kidney, which to them was a necessary lesion in a tubercular kidney. To-day, we know that the chronic nephritis is itself a lesion caused by the tubercle bacillus. Asch and Pousson have claimed that only kidneys that are diseased allow the passage of tubercle bacilli. These claims have been disproved by the experiments of Durand, Kahden, E. Meyer and Schweitzer, who showed that tubercle bacilli can pass through the kidney, without any lesion being present. It is very evident that it is impossible to come to a very definite decision on this matter at present, but we may conclude that every kidney which allows tubercle bacilli to pass through it, has these bacilli in its tissues, and that such an organ is the seat of a tubercular affection.

Tuberculin injections for the purpose of diagnosis have the object of determining the character of the disease and also the seat of the disease.

The positive tuberculin reaction, without painful local manifestations in the kidney, can be used for the diagnosis of tuberculosis of the kidney, only under conditions when one is positively sure that there are no other tubercular foci in the whole organism, a condition which can hardly ever be fully determined. Nor is the presenc of pain in the kidney with the tuberculin reaction a definite symptom of the disease, or the occurrence of pain on both sides during the reaction a contraindication to operation. While in the majority of cases, tuberculin injections cause a prompt reaction and localized pain in the affected kidney, yet there are cases where no such reaction and pain takes place.

11. *The Demonstration of the Seat of the Tubercular Disease.*—Firstly, there are certain symptoms which show that in tuberculosis of the kidney a specific disease of the bladder also exists. Aside from the fact that the bladder, if diseased, is very sensitive, it also has an extraordinary sensitiveness against the application of silver nitrate which is so significant as to make it an aid in the diagnosis of tuberculosis of the bladder (Guyon, 1889). A bladder which is reactive against silver nitrate is very likely the seat of a tubercular disease. Of course, there are exceptions, even to this. There are cases on record of tuberculosis of the kidney and tuberculosis of the bladder, where the application of silver nitrate gave rise to no disturbance or pain, but where its effect is rather beneficial than otherwise. It is very likely that cases where a secondary mixed infection has occurred are the ones so greatly benefited by the application of silver nitrate. Up to within recent times attempts have repeatedly been made to establish the diagnosis of unilateral kidney tuberculosis without the aid of instruments. Such diagnostic methods can, however, never compete with the thorough modern investigation.

In 1903, Bazy recommended the so-called "reflexe uretero-vesical" method, whereby pain is excited reflexly by touching the ureter's mouth on the diseased side, either through the bladder or the rectum or the vagina.

In 1904, Nicolich repeated the experiments made by Giordano in 1878 and Bergmann in 1885, of massage of both kidneys. He first washed the bladder clean. One ureter was then compressed against the pelvic bone and the other kidney vigorously massaged, the urine collected and examined for abnormalities. The same procedure was then followed with the other kidney for abnormalities. What this very crude method, which is useless to-day, might accomplish, is sometimes brought about by a spontaneous separation of the urine from the two kidneys by closure of the diseased ureter. This spontaneous separation of the urine when properly observed, can serve as a proper demonstration that the opposite kidney is functionating normally.

For a long time, Küster recommended that both kidneys be laid bare by operation for the diagnosis of tuberculosis, just as Rovsing recommended it for tumors of the kidney, and as Bazy, in 1900, practised the exploratory nephrotomy in preference to ureter catheterization in the presence of a kidney infection The pathological anatomy and unfavorable clinical experiences demonstrate that neither the exposure of the kidney or a nephrotomy is an absolute guarantee of a proper orientation of the diseased kidney.

Very demonstrative is the observation of Davidsohn, who took a kidney obtained by autopsy with no macroscopic evidences of disease, and removed twenty different sections for microscopical investigation for tuberculosis. In none of these sections were there evidences of the disease, and yet the kidney was the seat of tuberculosis, as quite accidentally a miliary tubercle was found which showed a giant cell.

Casper reports a case in which he had operated for tuberculosis of the kidney and being unable to find evidence of the disease, performed a nephrotomy only, removed a small piece of the kidney tissue for a microscopic investigation. No evidence of tuberculosis was found in the pieces removed and yet, fourteen days later, a very acute tubercular process started up in the operated kidney.

A sovereign method of investigation in recent times for establishing a diagnosis of tuberculosis of the bladder is the cystoscope. Of course, there are very many cases of tuberculosis of the urinary apparatus, especially in the male, where a great many difficulties are encountered with the cystoscopic examination. But these cases cannot be a sufficient reason to search for other methods of investigation for the general class of cases. We can be sure that with increased knowledge of the disease, these difficult cases will become less and less, because the patients will present themselves earlier in the course of the disease. It is to be regretted that even in more recent times, statements have been made that in those cases where a suspicion of bladder tuberculosis exists, the cystoscopic examination is contraindicated. At a meeting in 1901, Von Hoffman expressed the views of the authors on this subject in the following sentence: "The cystoscope gives us very valuable information, provided the suspicion is not aroused that a tuberculosis of the bladder exists, which contraindicates the use of instruments." In a similar fashion, Bandler and Goldberg expressed themselves in 1903. These views are greatly to be regretted, when we consider that as far back as 1878 Nitze gave us the cystoscope and Brenner in 1887 spoke of the use of the cystocope for ureteral catheterization, and expressed the view that tuberculosis of the bladder was not the beginning of the diseased process but the ending of a tuberculosis of the urinary apparatus, and moreover that the cure of the bladder tuberculosis, as a rule, is only accomplished by the removal of the tubercular kidney which is the focus of the disease.

An ordinary cystoscopic examination gives a clew as to the side on which the disease is present.

In reference to this matter, it seems to me that it is worth while to mention the opinion of Paffin, expressed in 1905. He says: "In the beginning, I frequently neglected a cystoscopic examination of the bladder in tuberculosis of the kidney, because the great value which the cystoscope affords in these cases was little known, and because there was an exaggerated fear of spreading the infection by the instrument. I was not slow in realizing my mistake."

In the ordinary cases, as a rule, we find that the mouth of the ureter of the diseased side is undergoing a change. First of all, there may be a swelling present. There is a reddened condition of the mucous membrane, an edema bullosum, which sometimes prevents an identification of the ureter opening. Ecchymoses, small tubercles and minute ulcers about the mouth of the ureter may also exist. Later in the disease, the ureter mouth may be deeply ulcerated, and, as a result of contraction, a shortening of the ureter occurs with a crater-like formation and loss of peristalsis. From this crater pus exudes, either in interrupted jets or in a fine continuous stream. I was able to find changes at the ureter mouth corresponding to the side of the diseased kidney thirty times in forty-eight cases, where the cystoscope examination could be made, and in one instance (case 19) there was also a change in the mucous membrane at the ureter mouth of the healthy kidney. Two cases were reported by Garceau. On the other hand, in nine cases with tubercular disease of both kidneys, there were pathologic changes in three cases at the ureter's mouth on one side only. But while in the majority of instances an ordinary cystoscopic examination already points to the side of the disease, yet we must not forget that in some cases this sign may be wanting, and in others the changes at the ureter mouth may be on the healthy side, and thus lead to an error in diagnosis.

There are also cases with inflammatory changes, and ulcerations occur at the ureter mouth resulting from conditions in the kidney, which is the seat of a stone formation or where a nonspecific pyelitis or pyonephrosis exists. There are also cases of disease of the mucous membrane of the badder with tubercle-like formations but which are not of a specific character. Casper also found the same tubercle-like formations in the mucous membrane of the pelvis of the kidney and likened them to a conjunctivitis. He therefore calls this condition of the mucous membrane of the bladder and pelvis of the kidney asapyelitis or cystitis granulosa. The so-called cases of "cystitis en plaques," described by Guttman, Hansemann, Landsteiner, Stoerk and Michaelis, also have tubercle-like formations on the mucous surfaces of the bladder, which might be mistaken for a tuberculosis.

But it is not sufficient for us to know on which side the disease exists, in deciding on an operation; we must also know whether a second kidney is present and if this kidney is healthy and functionating. We must become fully acquainted with the anatomical existence and functional capacity of both kidneys. This is possible of accomplishment in an exact way only by a double catheterization of the kidneys. That separators are not sufficient for this purpose has already been shown.

Under these circumstances the method of double ureter catherization should have been hailed as a means of great help in matters of this kind. This method of investigation has not succeeded, however, but obviously only among those who have not mastered the technic. In reference to this, in 1904, Kummell said very correctly "I hold this to be without exception, that once the surgeon has mastered the method of catheterization of the ureters and the method of thus investigating the function of the kidney, he will remain a warm supporter of this method. Only those deviate from this point who have not mastered this method." And furthermore he says "There is no disease of the kidney where ureter catheterization gives one such a definite diagnosis as in tuberculosis. We have found no disadvantages in any of our cases by the use of this method." While at present every surgeon with advanced ideas holds that ureter catheterization is absolutely essential in the diagnosis of unilateral tuberculosis of the kidney, the question whether we should catheterize the normal kidney also, when tuberculosis exists on one side, has not been definitely answered. Fritsch in 1904, Suter, Schede and Stoekl, in 1903, and Tuffiier were much opposed to the invasion of the normal ureter by the catheter.

The oft-repeated question, is it permissible to catheterize the normal ureter in the presence of tuberculosis of the kidney where the ureter and bladder have become involved, is to my mind no question at all, because in many cases we do not know which side is the healthy one. The purpose of ureter catheterization is to determine that very point. This applies particularly to those cases in which our ordinary methods of investigation, and even the cystoscope, leave us in doubt as to which is the diseased side. The greater our knowledge of the frequency with which unilateral disease exists, the less often will we come into contact with cases of pyonephrosis where we can definitely diagnose with the cystoscope the side on which the diseased kidney is located. In those cases, where there is but slight turbidity of urine and slight hematuria, we can only differentiate the diseased kidney from the healthy one by a double ureter catheterization. And furthermore, even in those advanced cases where the seat of the pyuria is clearly shown by the cystoscope in order that we may know the anatomic existence and functional capacity of the healthy kidney, a ureter catheterization is necessary. An investigation by means of the separators is not a certain way of finding out the location of the disease, and he who relies on this method need not be surprised when his nephrectomy is not crowned by success.

Furthermore, in many cases we had better omit the catheterization of the diseased than that of the the healthy kidney. When the ordinary clinical investigation leaves us in no doubt as to which kidney is the seat of tuberculosis, our interest next centers itself entirely on the healthy side, to prove its anatomical existence and its functionating power. In a case of this kind, it is sufficient to introduce the catheter a few centimeters only, and he who is master of his art, can do this without the catheter touching any other part of the diseased bladder. If the surgeon wants to be particularly careful he can first touch the mouth of the ureter with 1/1000 sublimate solution, after which all danger from cathteerization is removed. In fifty cases of unilateral tuberculosis of the kidney, this procedure was carried out by me, and in no case have I been able to observe the least harm from it.

By this method of ureter catheterization it is possible to establish a differential diagnosis between an ascending and a descending tuberculosis, between tuberculosis of the ureter and tuberculosis of the pelvis, as well as tuberculosis of the parenchyma of the kidney.

In the differential diagnosis, two points are to be considered: First, the fact that at the first introduction of the catheter into the ureter, urine turbid with pus appears which becomes microscopically clear upon further introduction of the catheter, cannot be taken as an absolute proof that we are dealing with a tuberculosis of the ureter. Because the same thing may be observed in the "Y"-shaped ureter where one arm leads to a tuberculous kidney, and the other arm to a healthy kidney (Kapsammer, case 23). But this may happen even where there is only one ureter leading to a tuberculous kidney. Turbid urine may appear first, and finally clear urine on further introduction of the catheter, because we may be dealing with a kidney which is the seat of a polyuria by reflex action. The pus under these conditions is so diluted with urine in the pelvis of the kidney as to escape detection.

Second, in cases with marked polyuria but with a normal functional test of the kidney, we may infer that the pus is the result of disease in the ureter, rather than in the kidney.

The circumstances mentioned above may also indicate that a perforation of a ureter abscess has occurred. Before an operation is decided upon in kidney tuberculosis, the determination of the functional capacity of each kidney is of the utmost importance. In this disease, we may find at one time a mild albuminuria or pyuria in a slightly diseased kidney, and at another time the same mild albuminuria may be found in an organ with extensive lesions. It is therefore very essential to determine the extent of the anatomic lesions by an exact functional test of both kidneys. It is to be observed here that in the beginning of the disease, the function of the kidney may be absolutely normal.

In tuberculosis of the kidneys, in order to determine the anatomic and functional conditions of the kidneys, it is necessary to catheterize both ureters.

THE DIFFERENTIAL DIAGNOSIS BETWEEN KIDNEY TUBERCULOSIS AND OTHER DISEASES OF THE KIDNEY.

Tuberculosis of the kidney may be mistaken for other diseases of the kidney with pus formations and pyelitis calculosa. The latter condition especially may be mistaken for tuberculosis, because an obstruction in the ureter may occur. But, as a rule, a differential diagnosis between these two conditions can readily be made by finding tubercle bacilli and by means of the x-ray pictures. On the other hand, a Röntgen picture may lead to mistaken diagnosis, because during tuberculosis calcareous deposits may also occur in the kidney with a resulting shadow in the picture. A differential diagnosis, however, is possible here because the shadows in tuberculosis of the kidney are very delicate and not of such sharp outlines as those of a calculus. Moreover, the shadows in tuberculosis lie in the parenchyma of the organ, while the shadows of a stone, as a rule, lie in the pelvis of the kidney.

THERAPEUTIC MEASURES IN TUBERCULOSIS OF THE KIDNEY.

Spontaneous Cure of Tuberculosis of the Kidney.—In tuberculosis of the kidney, curative measures on the part of nature may come about, such as connective-tissue formations, fatty proliferations, and calcareous changes. A lasting and definite spontaneous cure of tuberculosis of the kidney, however, has never been demonstrated (Bernard, Delbert and Reynaud). The few published cases so reported will not stand a critical investigation. Tubercular foci that are undergoing spontaneous healing are everywhere surrounded by active foci of tuberculosis (Reynaud). The disappearance of the tubercle bacilli from the urine is not an indication of cure, but on the contrary, according to Motz, it may be a sign of the progress of the disease. The fact that urine containing a large amount of pue clears up at times simply means that there occurs a spontaneous separation of the two urines by a closure of the diseased ureter, and we get clear urine from the normal kidney. This spontaneous closure of the tubercular ureter is not infrequently observed; Halle found in 103 autopsies in the Museum of Guyon, sixteen cases where this occurred, and ten cases where the ureter was about to undergo this closure. Cures of this nature must of necessity lead to further destruction of the organ.

Tuberculosis of the kidney has no tendency toward a spontaneous cure, but rather a tendency for the destruction of the parenchyma with loss of function, leading to the death of the patient.

Treatment by Tuberculin.—The tuberculin treatment of tuberculosis of the urinary apparatus has been worked out, up to the present day, so little that it is impossible to judge of it from any point of view. Favorable reports of this method of treatment have been made, but the treatment of a unilateral tuberculosis of the kidney by tuberculin cannot be considered at all at the present time. Because, in unilateral tuberculosis of the kidney, a nephrectomy gives us a definite cure and, on the other hand, by trusting to the tuberculin treatment, we run the risk of the other kidney becoming affected in the meantime. The tuberculin treatment occupies a different position in cases where both kidneys are affected. In these cases, which cannot be helped by an operation, a trial of this method is permissible.

In these cases not only should the tuberculin treatment be tried but other medical measures, such as the administration of guaiacol, iodine, etc., should also be employed. It is self evident that the milk diet, so frequently recommended, as well as drinking large quantities of alkaline mineral waters, are not alone without any effect on tuberculosis of the kidney, but in many cases harmful

The operative therapy is the only rational treatment that can be considered at the present day in tuberculosis of the kidney. The advice of some authors to refrain from operations in the early stages of tuberculosis of the kidney, until hemorrhages occur, or an abscess forms or perhaps the patient experiences great pain, is a relic of those times when Albert asserted "that nephrectomy in tuberculosis of the kidney is an error of the times, and it is necessary to warn against it."

We know to-day that in primary tuberculosis of the kidney which, as a rule, is unilateral, a nephrectomy brings about a definite cure, as long as the other kidney is healthy. We also know that when lesions occur in the other kidney, an operation on the diseased kidney is not so definite in its results, as far as a cure is concerned, but we do not know under what conditions lesions in the other kidney remain in abeyance. Therefore, it follows, that when a diagnosis of the existence of a tuberculosis of the kidney on one side, has been established, that fact forms an indication for an operation and the removal of the diseased kidney.

The next question arises as to the method of operation.

In 1895, Von Bardenheuer recommended resection of the kidney in tuberculosis. This recommendation was defended by Kuster and Reger, but it was carried out only in a limited number of cases by Czerny, Israel, Morris and Watson. Wolff could only collect nine of these cases. With our present knowledge of the pathologic anatomy of tuberculosis of the kidney, the operation of resection need not be considered at all.

Von Strubing recommended a nephrotomy for the early cases of tuberculosis of the kidney and claims that by diverting the current of urine, the ureter and bladder are relieved of their function. The bladder difficulties improve and, on account of the splitting the capsule of the kidney, pain is relieved and conditions are brought about favorable to a spontaneous cure of the disease.

Practical experience has demonstrated that these therapeutic ideas of Strubing are not well founded. We have observed that after nephrotomy, very frequently the tubercular process has rapidly advanced in the kidney and in some cases even a general tuberculosis results.

In the early stages of tuberculosis of the kidney, the operation of nephrotomy should be absolutely abandoned.

In the later stages of the disease, the operation is undertaken quite frequently, but, it must be acknowledged, with very unfavorable results. As a rule, a nephrotomy is done at a time when the character of the disease is not fully established or else a definite knowledge of the condition of the other kidney is not at hand. It may also be performed in those cases in which on account of lack of investigation by the newer methods, a proper orientation has not been achieved.

Von Tuffier reported, up to the year 1900, seven cases of nephrotomy in tuberculosis of the kidney. Two of these were cured, two died, and three had fistulæ subsequently.

Among twelve cases of nephrotomy reported by Albarran up to 1900, ten died, one immediately after the operation, and nine in the following months. Two were later cured by a secondary nephrectomy.

Pousson reported nine cases of nephrotomy up to the year 1904. Two died during the operation, four died a few months later, and in three a nephrectomy had later to be performed, of which one died. The total mortality in his cases amounted to 77.78 per cent.

According to Pousson, who collected the cases, it was found that sixty-three cases were operated on in this manner, out of which thirty-nine died, a total mortality of 61.70 per cent. On the other hand, 335 cases of nephrectomy resulted in forty-two deaths, a mortality of 12.53 per cent.

According to Küster's collections, of ninety cases nephrotomized for tuberculosis of the kidneys, more than one-half had to have a secondary nephrectomy performed.

It would hardly be fair to believe that a secondary nephrectomy as a rule can be performed under as favorable conditions of the patient as if the operation had been done first. Very frequently the condition of the patient becomes aggravated as a result of suppuration and fistula formation, and furthermore, the repeated narcoses react unfavorably on these cases. Moreover, a secondary nephrectomy brings with it technical difficulties and the patient who would have withstood a primary nephrectomy might not survive a more difficult secondary nephrectomy.

Therefore, a nephrotomy for tuberculosis of the kidney has only the value of an operation done as a last resort. In cases with high temperatures, due to pyonephrosis, nephrotomy may become a vital indication and the operation may be called for, when on account of the condition of the patient, it is impossible to investigate the state of the other kidney, or where on investigation lesions are also found in the other kidney. In the future, cases of this kind will become less frequent because the condition can be recognized early in the disease and handled in a different manner.

The Therapy of a Unilateral Kidney Tuberculosis is a Nephrectomy. —The operation was performed for the first time in 1872 by Peters.

The indication for a nephrectomy also exists when other non-florid foci of tuberculosis are present in the organism, as in the lungs, genital organs or bones. As a rule, in cases where tuberculosis of the kidney is the principal focus of the disease the removal of the diseased kidney will also benefit the tubercular process in the other organs.

In fact, even the unhealthy condition of the other kidney does not form a "conditio sine qua non" for a nephrectomy, as long as the other kidney is able to take up the entire excretory urinary function. In advanced cases of tuberculosis of the kidney, a lesion will be found also in the second kidney, which, however, as a rule, is not of a specific nature. The anatomical and functional lesion of the second kidney, as a rule, also improves after a nephrectomy It is in these cases that the great value of the modern tests of the function of the kidney shows itself. These modern tests will enable us to decide the border-line cases and determine whether or not a nephrectomy is still permissible.

Even in cases with tuberculosis in both kidneys, conditions may arise calling for a nephrectomy. When the functional tests show that we are dealing with a pyonephrotic kidney, which is completely destroyed and the urinary function is carried entirely by the other kidney, although the seat of a tuberculosis, the general organism will derive benefit from the extirpation of the pyonephrotic kidney.

An example of the value of a nephrectomy where both kidneys are affected with tuberculosis, is shown by a case of König's. A woman, five years after a nephrectomy, married, passed through a normal pregnancy and died seven years after the operation, shortly after a second difficult confinement.

For the extirpation of a tubercular kidney, only the extraperitoneal lumbar incision need to be considered. The incision begins at the end of the twelfth rib and extends to the beginning of the outer third of Poupart's ligament (Bergmann). If necessary, this incision can be extended further, parallel to Poupart's ligament, for the total extirpation of the ureter. As a rule, the kidney is removed subcapsularly. If the capsula adaposa shows tubercular involvement, it should also be removed. According to Albarran the total extirpation of the diseased capsule bears a relation to the frequent fistula formation following nephrectomy. Very little attention has been paid to the disposition of the tubercular urtere in nephrectomy. As a rule, the ureter is cut away from the pelvis of the kidney and tied off, many times resulting in postoperative complications. This postoperative complication may consist in a long-continued suppuration of the wound and fistula formation (Zuckerkandl). Cases have also been observed where the diseased ureter, left behind at the time of operation, resulted in a tubercular process in the retroperitoneal tissues, and a case is also on record in which a specific basilar meningitis led to the death of the patient (Voelker, Tilden Brown). Similar postoperative complications may finally lead to the secondary ureterectomy.

Observations of this kind naturally raise the question whether the ureter should not be removed at the time of the nephrectomy. Up to this date, the majority of the surgeons prefer to leave the ureter behind. Various methods have been adopted with the object of preventing the spread of the infection. For example, the ureter is severed between two ligatures with a thermocautery ((Israel), the end of the ureter is sutured and turned in (Küster), or the remaining ureter is sutured to the skin (Israel and Povsing).

The lumen of the ureter may be cauterized by a specially prepared platinum loop. Iodoform and carbolic-acid injections have also been used. Ureteral treatment with 1 1000 sublimate solution by means of a catheter introduced into the ureter by way of the bladder (Kapsammer), has also been employed.

The most radical procedure would be to perform a total ureterectomy. If the ureter, however, does not appear involved in its lower portion an extirpation of ten to fifteeen centimeters proves sufficient. If the ureter is involved lower down and near the bladder, then a total ureterectomy must be performed, if necessary through an enlargement of the incision, as recommended by Bergmann. If the bladder has not become adherent to its surrounding structures, traction will bring the lowest end of the ureter into the field of operation. In tuberculosis of the kidney, I always endeavor to remove the ureter and loosened up kidney in one piece (Kapsammer, 1904). Although ureterectomy has been commended by Garceau, Israel, Lobker, Pousson, Pignier, Reynolds and Zuckerkandl, the operation was seldom performed until recently. In 1903, Bovee could only collect fourteen cases of nephroureterectomy.

After the ureterectomy the bladder tuberculosis should not be left to itself, but it should at once be treated locally with specific measures, such as sublimate, 1/1000, guaicol iodoform, 3 : 2 : 30, or with 1/1000 hydrargyrum oxycyantum. Some such measures, as a rule, lead to a cure of the secondary bladder tuberculosis.

Cases of spontaneous cure of cystitis after the tubercular kidney has been removed are those bladder affections that have not been specific in nature. In 1906, Baffin declared that a cure of bladder tuberculosis after a nephrectomy is but seldom observed, which was due to the fact that previous to that time an exact specific local treatment of the bladder after the operation was seldom employed.

TRANSACTIONS OF A JOINT MEETING OF THE OBSTETRICAL SOCIETY OF PHILADELPHIA AND THE GYNECOLOGICAL SOCIETY. OF CHICAGO

Philadelphia, May 9, 1913.

DR. RUDOLPH W. HOLMES, *President of the Chicago Gynecological Society, in the Chair.*

DR. CHARLES E. PADDOCK, of Chicago, read a paper on

APPENDICITIS COMPLICATING PREGNANCY.*

DISCUSSION.

DR. HOLMES.—My early medical career was in the field of ophthalmology; the ambition of my youth was to reach the dignity of the presidency of the Chicago Ophthalmological Society, an honor which was granted my father. However, my inclination for obstetrics and gynecology brought me into a more congenial atmosphere, and thwarted this early ambition. Then, my hopes were that I might acquire the honor of being the presiding officer of our local gynecological society. The honor has been thrust upon me, but I never realized that the occasion ever would present itself that I would come to this wonderful building of the College of Physicians and be in such a position that even for a moment I should be the presiding officer of your great Obstetrical Society. We men of Chicago always have had a high esteem for the great work you men of Philadelphia have been doing in our profession: it is a privilege for me to come here to express this regard, voicing the sentiment of my confreres as well as my own personal feeling.

I want to express to you how deeply the members of the Chicago Gynecological Society appreciate the honor and pleasure of being with you to-night. We hope that the day may be not far distant when you as a body may be the guests of our society.

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* For original article see page 401.

Dr. E. E. Montgomery.—We are certainly indebted to the Chicago physicians for the pleasure of their visit and to the author of the exceedingly interesting, instructive and comprehensive paper upon the subject of "Appendicitis Complicating Pregnancy" which we have just heard. When we consider the frequency of diseased appendices in patients upon whom we operate for pelvic conditions, the not infrequent displacement downward of the cecum and the situation of the appendix in the pelvis, it is rather surprising that we do not have this lesion more frequently complicating pregnancy. It can be readily appreciated that when such disturbance occurs in the pelvis the physician who is not alert may attribute the condition to threatened abortion. The pain in cases which have come under my observation, is high up, as has been mentioned by the reader of the paper toward the region of the liver, or lower down than the ordinary situation of McBurney's point. This is undoubtedly not infrequently due to the fact that the appendix situated low, has become fixed and that the pressure upon the cecum by the enlarged uterus increases the distress. The pain, the resistance, the increased temperature, the disturbance particularly upon the right side, should be factors leading to the recognition, or at least, the suspicion of appendicitis. I do not think the possibility of confounding this with ovaritis is very great. We are not likely to have complications of tube or ovary during the progress of a pregnancy. I fully agree with the writer as to the wisdom of early operation, and that when we have patients suffering from appendicitis, especially in the early stages of pregnancy, it is much wiser to operate. Though the woman may recover without operation she is in less danger to undergo the operation at this period than if she waited. As has been mentioned, the danger is so much greater in the later stages of pregnancy, that such possibility should not be permitted to occur. I have seen patients who have had appendicitis complicating pregnancy in whom the peritonitis has involved not only structures in the pelvis but the entire surface of the uterus.

It is important after this operation has been performed that the patient be kept well under the influence of morphia to prevent abortion or premature labor. I can heartily concur with the writer as to the wisdom of early operation, of removing the appendix as soon as it is known that the inflammatory condition exists and not allow the patient to run the risk of a more serious operation at a subsequent period.

I again want to express my pleasure at having had the privilege of listening to Dr. Paddock's valuable paper upon this subject.

Dr. W. Easterly Ashton.—I am glad the author of the paper brought out with emphasis the close connection between disease of the appendix and uterine adnexa. Those of us who operate frequently in the pelvic cavity are struck by the common occurrence of adhesions between the appendix and the uterine adnexa. This being the case, we can readily understand the frequency with which we meet appendicitis in pregnancy. When that condition does occur in the pregnant state we have added dangers to an already dangerous condition. Personally, therefore, I never hesitate when appendicitis develops during pregnancy to operate at once, as I believe the patient has a much better chance of ultimate recovery. Many of these cases if operated on early are found to be more or less catarrhal in character and unassociated with suppuration and rupture.

Dr. Montgomery brought out a point often forgotten: the infrequency of an ovarian lesion obscuring the diagnosis. It is therefore unnecessary to take into consideration these adnexal conditions and the diagnosis is, after all, therefore not so difficult in the majority of cases.

The incision should be made well on the side. There is less danger to the gravid uterus and the conditions surrounding the appendix are better handled than by the median incision.

I wish personally to thank Dr. Paddock for his paper which has been very illuminating to me, as I have no doubt it has been also to other members of the Society.

Dr. John B. Deaver.—Dr. Paddock's paper covers so much territory that it is impossible in five minutes to discuss it. I will, therefore, refer only to two or three points and chiefly to the question of etiology and diagnosis. We all must agree that appendicitis is an infectious disease, that there is some relation between the appendix and the ovary. We know that there is a connection between the lymphatics of the appendix and the lymphatics of the right uterine appendage. We also know that the infection need not necessarily be in the current of the lymphatic stream. Therefore, I believe that pelvic infection may have its origin in the appendix, and *vice versa.* The diagnosis of appendicitis is not always perfectly clear. This is particularly so if the appendix occupies the pelvis. In the latter case rectal examination is of much importance. A point upon which I lay much stress is left-sided abdominal pain in pelvic appendicitis. I see a great many cases of pelvic appendicitis overlooked because the pain is on the left side.

When the appendix is located retrocecal, we have the pain referred to the right abdominal quadrant high up and the diagnosis may be more difficult. Pain need not necessarily always be referred to McBurney's point. It is difficult to always differentiate catarrhal appendicitis. In the diagnosis of appendicitis in the pregnant woman the most important thing is the history. Given a patient previously well, developing pain followed by vomiting, rigidity and tenderness, in the great majority of cases there is appendicitis. A twisted uterine pedicle, etc., must be considered. I do not wonder that the gynecologists have so high a mortality in appendicitis with peritonitis when we consider the possible involvement of the adnexæ. The important question is the treatment of the peritonitis. In general or diffuse peritonitis operation should not be done. The condition calls for anatomic and physiologic rest. Our mortality in acute peritonitis is now 2 1/2 per cent. where it used to be 30 and 40.

In the matter of incision, I never could understand why the median line should be selected except there be a localization there. In the ordinary case the farther you keep away from the uterus the less likely to injure it. In those advanced cases in which the uterine wall forms part of the abscess cavity there is a high mortality for mother and child.

DR. RICHARD C. NORRIS of Philadelphia read a paper on the

TREATMENT OF OVARIAN NEOPLASMS COMPLICATING PREGNANCY AND LABOR.*

DISCUSSION.

DR. R. R. SMITH, Grand Rapids, Mich.—I wish to express our appreciation and thanks for the cordial hospitality with which you have received us, the members of the Chicago Gynecological Society. We shall hope to entertain you in the near future in Chicago. I wish I might discuss this paper from a little larger personal experience than I have had, as a paper of this kind really should be discussed. I have come to believe that the complication is an extremely rare one. Personally I have seen fewer cases than Dr. Norris. However, I believe that we may judge from the experience of others of the condition and formulate general ideas as to treatment. I think we have been unduly alarmed by the report of the earlier cases. The complications were so many and so serious that we were led to believe the condition extremely serious. With the more careful watching and hospital care received by the pregnant woman to-day I believe we may regard the condition as less serious. However, one's attitude should be decidedly radical. All the early cases should be operated upon as soon as the woman may be conveniently removed to the hospital. It may be well enough to wait for four or five months, as recommended by Pfannesteil, until the child is viable and then operate. He believed that we should operate upon all the cases in the latter months of pregnancy, remove the tumor and do a Cesarean section. If a case were seen during pregnancy the indications would be various, and generally speaking, I think I should prefer Cesarean section with removal of the tumor. If there were complications I should open the abdomen and remove the child and the uterus with it. I should watch any uncomplicated case during the puerperium lest accident arose such as torsion of the pedicle, when the tumor should be removed. No woman should be allowed to become again pregnant without removal of the tumor.

DR. T. J. WATKINS, Chicago.—I desire to express my appreciation of the very valuable paper that Dr. Norris has given us in so direct a manner. I agree rather fully with what Dr. Norris has said. In regard to statistics, however, one is impressed with the feeling that they are far from being accurate—that they are statistics of the severer cases, that the cases with ovarian tumors that have gone through without any complications have not been reported or have not been observed. It seems to me that one should have some hesitation in always advising the removal of the ovarian cyst in the presence of pregnancy. There is a question whether the danger of losing the child is not greater than the danger of leaving the tumor. A case with an ovarian cyst should be kept under careful observation. Such a patient should not be allowed to go on with a tumor if the woman lives in the country a long distance from competent surgical aid. In the study of individual cases there would seem to be no danger under favorable conditions in allowing a pregnancy to continue as long as the tumor did not interfere with gestation. In case the pedicle became twisted an immediate operation would give as good result as before the twisting took place.

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* For original article, see page 420.

Then comes the question of tumors. Of these there are two classes: One in which the tumor may interfere with labor, obstructing the parturient canal; and the second, in which the tumor is so large that it may interfere with gestation or labor. It would seem consistent with good surgery to allow any tumor that would obstruct delivery to remain until the child became viable or until the pregnancy comes to term and to then do an abdominal section, remove the tumor and make Cesarean section. I was a little surprised to hear of the delivery of the pregnant uterus through the abdominal incision as I was of the opinion that it had become quite general to incise and deliver the uterus *in situ*, that there was not the danger from the amniotic fluid formerly believed to exist and which was the primary reason for delivering the uterus before incising.

In the case of large tumors that may interfere with labor or that may cause accident, it would seem consistent with good surgery to put such a case in a hospital and allow labor to start. Extreme care should be taken regarding vaginal examinations, because the rule seems to be a good one, that any woman examined during labor is infected so far as Cesarean section is concerned. Such examinations are a great complication to Cesarean section. In an infected case if labor does not proceed readily abdominal section is indicated for removal of child, uterus and tumor.

In the class of cases mentioned by Dr. Norris in which abdominal section must be done in the presence of an infected uterus or a uterus supposed to be infected, the proposition is a difficult one, because the experience of nearly all operators is that a Cesarean section on an infected case gives a very high mortality. So high is it, that it is better to remove such a uterus than to leave it.

DR. N. S. HEANEY, Chicago.—Any ovarian cyst that presents any suspicion of infection or of twisting of its pedicle, or which begins to increase rapidly in size—suspicious of malignancy—should be removed at once, irrespective of the period of pregnancy, and the pregnancy handled according to the conditions encountered. Under such circumstances the tumor is the important thing, the pregnancy of minor importance.

When an ovarian cyst is complicated by a pregnancy under the fourth month I would consider it indicated to remove the cyst at once although it thus far had given no trouble. Under this management a certain number of cases will abort, but abortion is not very frequent when great care is used at the time of operation and sedatives are not spared in the postoperative attention. Abortion at this early time is, at any rate, a relatively simple affair compared to the possibilities in the nonoperative treatment.

The pregnancy assumes so much importance after this time that a complicating cyst should not be removed unless it is producing difficulty. The patient in such a case should be placed where she could be treated fairly promptly in case she gets into difficulties. She should be cautioned against those things especially provocative of torsion and instructed in the early recognition of such an event.

If the cyst lies free in the abdominal cavity at term, normal birth should be anticipated and the cyst removed as soon thereafter as the case merits. In case, however, the cyst should occupy the small pelvis the case is under most circumstances most conservatively treated by a Cesarean section and removal of the cyst in the early part of labor.

Should one encounter a parovarian cyst and pregnancy, the attempt to remove the cyst usually is combined with so much difficulty and associated with so much hemorrhage that a hysterectomy has often to be resorted to in order to stay the bleeding, that no effort should be made to remove the cyst, but instead, the cyst should be incised, the edges of the incision sewed so that the cyst may drain continuously into the adbominal cavity. This procedure preserves the uterus and the pregnancy and fulfills the indication for operation—the removal of obstruction from the passageway, and usually will cure the cyst.

Dr. Richard C. Norris.—I am sorry no one discussed the time for operation on tumors first discovered after the middle of pregnancy. That is a very important question. Any man of experience, meeting with a tumor obstructing an otherwise uncomplicated labor would not hesitate to remove the child by Cesarean section expecting a living child and good convalescence. But this question of Cesarean section is wrapped up closely with uterine infection. These cases sent to us by the general practitioner have been handled and the danger of Cesarean section as an elective operation is great. The question comes up, is it as safe to deliver such women by Cesarean section, as to operate extraperitoneally and reduce the mortality. There is the problem that our best minds should consider. Personally, I would rather in some such cases take the chance of a subsequent delivery through the natural passage. Dilatation of the cervix and delivery by forceps with 75 per cent. recoveries from sepsis is more desirable than Cesarean section under conditions giving a higher mortality. If I were in doubt I would prefer this and leave the uterus in. If you do Cesarean section and remove the tumor, when infection is certain, you have got to take away from that woman all chance of offspring by removing the uterus. Supravaginal hysterectomy with extraperitoneal treatment of the stump gives a better mortality rate than complete hysterectomy. This is the important technic for infected cases. Eventration of the uterus in Cesarean section on infected cases one can easily believe adds distinct safety to the operation. Eventration of the uterus is a question apparently of locality. In New York it is usually not employed, in Philadelphia it is the rule to almost always use it. The future results of extraperitoneal Cesarean may give that operation a place in treating labor complicated by an ovarian tumor, the uterus but not the tumor being infected.

Dr. Frank W. Lynch read a paper on the treatment of

UTERINE FIBROIDS COMPLICATING PREGNANCY AND LABOR.[*]

DISCUSSION.

Dr. Edward P. Davis.—I join in the pleasure which we all feel in the presence of our guests and friends from Chicago, and especially in the very interesting and complete presentation of the subject of fibroids of pregnancy made by Dr. Lynch. I desire to call attention to but one phase of this subject: the development of fibroid changes in the uterine muscle so small as to be unnoticed during pregnancy, and yet complicating pregnancy, influencing the course and period of gestation, preventing the development of labor and to some extent affecting the nutrition of the child.

Four cases have come under my observation. Two were primiparous women. Each had a normal pelvis and her physiological condition seemed normal. In no case was a palpable tumor present. Each woman did not go into labor in anything like reasonable time. Offspring was earnestly desired and Cesarean section was accepted. On section, the uterus was found to be the site of fibroid growths so small as scarcely to be perceptible. As it was possible to suture the muscle though sound tissue, the uterus was left undisturbed with uninterrupted recovery of mother and child. Had the condition been treated by interference with bougies, there would have been the risk of infection, the difficulty of labor with a deficient action of the uterine muscle, the absence of the natural factors for producing dilatation would have damaged the child and mother.

In some women where prolongation of pregnancy does not occur there are changes in the uterine muscle which are not of a size to be called fibroid tumors but are fibroid in nature and demand treatment of surgical character. In multiparous women where the same changes occur and lead to prolongation of pregnancy ending in difficult labor there is the risk of infection. A multipara was recently brought into the Jefferson Maternity in whom efforts had been made to deliver. Section was done and a child delivered weighing 12 pounds and 12 ounces. The uterus was infected and bruised in the lower segment. A Porro operation saved the life of the mother, the child died from cerebral hemorrhage. The uterus was the seat of changes described. In this case the fibroid changes were not sufficiently large to be called tumor but the condition was demonstrated by section.

Dr. Lynch spoke of the difficulty of making the diagnosis. In one case when we had operated the tumor had vanished. The patient was brought to the Pennsylvania Hospital pregnant and with the diagnosis of tumor. The patient was examined by the house staff and the tumor was present. At the operation the tumor could not be found. Examination showed that fibroid change had taken place in the uterus in such a way that during the life of the fetus the tumor was present. The condition was made possible by the irregular contraction of the uterine muscles and the exciting cause was the presence and movements of the fetus.

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[*] For original article, see page 427.

Dr. Wilmer Krusen.—My attention has been particularly directed to the subject of fibroids complicating pregnancy by the fact that a few years ago a visiting gynecologist came to Philadelphia and captured, I think, the Mutter Prize for a series of fibroids complicating pregnancy. We thought it time to review our own cases. At that time I had a series of five cases of fibroids complicating pregnancy. Curiously enough by that coincidence which often characterizes surgical work, four had occurred in two months. Since then I have had five others. These represent the different complications of fibroids. The first case was that of a primiparous woman aged thirty-seven seen with Dr. Prendergast. She was seven months pregnant and suffering with acute nephritis. She had albuminuria retinitis and the situation was something like this: The pelvic cavity was filled with the tumor and the pregnancy was above with marked pressure from the diaphragm. We had a perplexing condition to deal with. There was no possibility of inducing labor, no possibility of abortion, because the pelvic cavity was filled with the tumor and the pregnancy was above. After consultation with Dr. Clark, I decided to do Cesarean section. The patient succumbed. There was no hope of spontaneous delivery and we simply gave the patient the one chance in a hundred.

A second case was one of pregnancy in a bicornate uterus. Upon examination there could be felt on the right side a mass. We first thought the case was one of appendicitis in pregnancy, but on careful examination a similar mass could be outlined on the other side. The specimen was exhibited to this Society. The only thing to do here was hysterectomy.

The third case illustrated a similar condition, except that the tumor was above and the pregnancy was below. The tumor weighed 2900 grams. There was no possibility of normal termination of the pregnancy and we had to sacrifice the fetus. The other patients presented similar problems.

Dr. Barton Cooke Hirst.—I want to put on record a few cases of uterine fibroids complicating pregnancy and to express my indebtedness to Dr. Lynch for his valued presentation of this subject. I have had fifteen operations for fibroid tumors complicating the process of generation, including two cases of fibromyomata of the round ligament in the inguinal canal. They had begun to grow in pregnancy reaching the size of an orange before gestation was completed. I think Dr. Lynch did wisely in calling our attention to the rarity of operations for fibroid tumors in the child-bearing woman. The St. Petersburg statistics which he quotes show four operations in 13,000 pregnancies.

There is no doubt that the man who operates often for this indication in pregnancy lays himself open to criticism, but there are conditions which demand it. In two of my cases there was complete breakdown of the kidneys from increased intraabdominal pressure and a grave toxemic condition. In another case the pain was so acute that the patient could not endure it. The tumors in this and a similar case were in the broad ligament and although connected with the uterine wall and enucleated, there was no abortion. Another patient demanded operation because of the excessive distention of the abdomen. The skin of the abdomen glistened like a mirror and the patient just before anesthetization, urged us to hurry for fear she would burst. The pregnancy was at the seventh month and the baby was saved. The other operations were for tumors obstructing labor or degenerating in the puerperium.

I wish again to express my gratitude to Dr. Lynch for his valuable paper.

DR. RUDOLPH W. HOLMES, President of the Chicago Gynecological Society.—My natural predilection is for obstetrics. Therefore, I look upon these questions from an obstetric viewpoint rather than from that of pure surgery. We may eliminate the subject of appendicitis, as I hold it immaterial whether appendicitis occurs in the obstetric relation or not, for the indication for surgical intervention is the same in both. My attitude toward ovarian cysts of a material growth coincides with this view of appendicitis in this connection, whether they offer interference to labor or not. Of course, where the cyst presents any obstruction to labor an abdominal operation is imperative.

On the other hand, I firmly believe that many fibroids which are removed in pregnancy are merely evidences of disturbed anatomy and have no real pathological significance. In the routine examination of the pregnant I not infrequently discover small fibroids which coexist with the pregnancy but that fact does not warrant surgical intervention, which amount to needless mutilation. I believe this cannot be too strongly emphasized that fibroids in the obstetric relation which offer no obstruction to labor, and do not present any symptoms in pregnancy, should not be ruthlessly removed. When a fibroid blocks the pelvis, when it causes pressure symptoms, or material reflex manifestations, when hemorrhages are produced, or when there are evidences of fibroid degeneration, then I hold it is wise to operate. In going through museums connected with hospitals and colleges, and seeing so many fibroids which have been removed coexisting with pregnancy but offering no suggestion of complicating that state, I have wondered if the fact of pregnancy was recognized before operation, or if an attempt was made to accumulate interesting specimens. I would call attention to a fact too often overlooked, and rarely mentioned in the literature, that very often fibroids, or perhaps to be more correct, myomata, may greatly increase in pregnancy, *pari passu*, to the uterine growth, and after labor undergo the same processes of involution as does the uterus. I have in mind a young woman I saw first in labor with a fibroid of the lower segment which completely blocked the pelvic cavity; her child was dead; both she and her husband strongly prohibited any interference which would rob her of a possible subsequent pregnancy. It was found that the nature of the tumor precluded removal without total hysterectomy. While appreciating the described risks of leaving such a growth, still I felt the patient had her rights, so a Cesarean section was performed. In the course of the next months the tumor had involuted to an insignificant size; as far as my knowledge goes she has not conceived again—still, if not, she has not been robbed of the hope of maternity which is a great deal. Not so long ago I delivered a woman who had a discoid fibroid, pedunculated, and attached to the upper anterior wall, which was fully 1 foot in diameter and 2 or 3 inches thick; some months later, on opening the abdomen for tubal trouble I found the tumor had shrunk to the size of a small pea.

The ability of the general surgeon or gynecologist to remove a fibroid does not enter into the discussion, but I think it a serious defect of our system for a man who has not an intimate contact with the pregnant, one who has not developed the obstetric sense, so to speak, one, therefore, who has not a clear perception of the vagaries of the pregnant uterus, to attempt to lay down indications for operation for fibroids which may coexist with pregnancy, and possibly may or may not be considered a complication. The placing of indications in this as well as all other obstetric complications belongs to the trained obstetrician.

Barring acute and pressing indications I believe no fibroid should be removed in pregnancy; if obstruction to delivery is present Cesarean section with hysterectomy should be employed; perhaps, rarely conservation of the uterus may be practised. In general the retention of the uterus and fibroid, as cited by me, is a mistake —still so long as the uterus remains the woman has the hope of child-bearing.

Dr. George M. Boyd.—The discussion brings out the difficulty of making diagnosis, particularly of the interstitial fibriod, even when you have it in view; also the difficulty of making a differential diagnosis between fibroid and pregnancy and emphasizes the training one should have in obstetrics to acquire diagnostic skill. It also brings out the fact that a woman pregnant, and having a fibroid, need not necessarily have trouble. It has possibly been a mistake in the past to have operated so frequently for fibroids during pregnancy. They may give trouble, but the vast majority will go on to term without difficulty. We should not be guilty of unnecessarily removing the uterus and depriving the patient ever afterward of child-bearing.

Dr. Lynch, closing.—In my paper I emphasized the fact that interference is seldom necessary and that there should be indications for operation during pregnancy, other than the condition of the fibroid itself.

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of April 8, 1913.

The President, GEORGE GRAY WARD, M. D., *in the Chair.*

DR. JOSEPH BRETTAUER presented a specimen of

PERITHELIAL SARCOMA OF THE OVARY

which he had removed the day before from an unmarried woman, fifty years of age.

He saw her first about ten years ago, when he found the uterus enlarged by the presence of small multiple fibroids. For the past two and one-half years the patient suffered from occasional attacks of pain in the lower abdomen, frequent micturition and loss of weight. Menstruation ceased three years ago. Her family physician referred her to the hospital thinking that the increased size of the abdomen was due to the growth of the existing fibroid condition of the uterus.

When the patient was examined under anesthesia by Drs. Furniss and Ward, two distinct masses were felt, one, a large nodular uterus, and to the right of this, higher up in the abdomen, another mass, somewhat larger than a child's head, which appeared soft and pseudo-fluctuating and was freely movable. The uterus and mass were removed *in toto* by supravaginal hysterectomy.

The interesting feature is the microscopical examination of the specimen, which shows the origin of the neoplasm from the perithelial lining of the capillaries. A more detailed microscopical description will be reported at some future meeting.

The evening was given out to a discussion of Clinics given on the two preceding days.

DRS. BRETTAUER and BRICKNER gave a

CLINIC AT MT. SINAI HOSPITAL

on April 7.

DISCUSSION.

DR. BOLDT.—It gives me great pleasure to have seen Drs. Brettauer and Brickner operate, and permit me to say that the setting aside of one or two clinical days in the year is most instructive, and should be appreciated. We can learn much from this procedure. Although we may not find everything as we do it, after all these small things are only matters of opinion. There was nothing at the Clinic from which I did not learn.

As regards the paticular operations, Dr. Brettauer's specimen shows conclusively that one should never use a trocar unless he is sure he is dealing with a unilocular cyst. Dr. Brettauer suspected malignancy and found it. One must never puncture for fear of contaminating the peritoneal cavity, and getting secondary metastases. I was much impressed with the Doctor's use of the double stitch, going through the peritoneum first on one side and then on the other. This is not a running stitch, and is a valuable time-saving device.

Another feature which impressed me was his use of Chinese twisted silk, a material which we formerly used extensively to tie off the vessels. This makes an excellent ligature material.

The third feature which drew my attention was the use of interrupted silk sutures to approximate the fascia without any overlapping. There is one question which I would like to ask Dr. Brettauer. "Doctor, in how many instances do you have trouble arising from the use of silk, and how frequent is the occurrence of hernia?" As far as my own experience goes with such tumors, and as far as I can recall from the literature, in the course of from two to five years there is a recurrence, not meaning to imply that there is necessarily an implantation of the same tumor, but that recurrence is almost certain, soon followed by death. The technic was perfect, and I have no comment to make regarding it.

In reference to Dr. Brickner's work, he operated upon a tubo-ovarian abscess. There was nothing to which my attention was called, except to use a slang term, "He was up against a snag." It was a case of uncontrollable uterine hemorrhage, which I thought was due to the adnexal condition. Dr. Brickner did admirable work, but I believe he would have saved himself much time and hardship, if he had made a larger incision on such a fat woman as this patient was.

Dr. Henry Dawson Furniss.—While Dr. Brettauer worked with no evidence of rapidity his operations were all done within a very short time. His technic was good and the steps of the operation well planned and well executed.

I was much impressed with the simplicity of the table he used. The leg holders allowed the patient to be put in such a position that vaginal work during the abdominal operation could be done with very little change of the position of the patient. By raising the leg holders the lordosis that is produced by many tables is obviated; this allows greater abdominal relaxation, and the patients suffer less from backache after operation.

I was rather surprised to see Dr. Brettauer use dry gauze in packing off the intestines, and that many of these pads had no tapes and were not clamped when put in the abdomen.

There were more assistants in the operation than the work really called for—two nurses, one anesthetist, and four assistants.

The anesthetic in the first case was poorly given, the pressing downward of the viscera seemed to me to be due to too deep, rather than insufficient anesthesia, and yet the anesthetist was pushing the ether to secure more relaxation. In the other two cases the anesthetic was well given, and calls for no comment.

While I have given principally the objections, I wish to assure you that I was impressed and much pleased with Dr. Brettauer's work.

Dr. Stone.—I was present at the Mt. Sinai Clinic yesterday, and Dr. Brickner's case of uncontrollable hemorrhage impressed me as being one which had been treated conservatively for a while, and then came to operation. This I believe, is also Dr. Brickner's idea.

There are three points worthy of note. First, Dr. Brickner and I graduated twenty-two years ago, and this is the first time I have seen him operate. The case was a difficult one, and as Dr. Boldt told me, a case he should not have picked out to show to visitors. There were many adhesions all over, and Dr. Boldt concurred with me in the belief that he handled the case extremely well. One should adopt a technic which is suited to his individual case, and here the doctor had to work out his technic as he went along. Second, as regards the pathological and clinical course of this case the Fallopian tubes had a chronic salpingitis, which had probably lasted for years. The tubes were enlarged, the walls were thickened, but there was no accumulation of secretion. In other words, the terminal stage had not yet been reached. Third, in reference to the cervical mucosa, Dr. Frank kindly opened the cervix for us. It is questionable whether or not it showed beginning malignancy, at any rate, it showed us that the more crevices we see, the fewer do *not* show a local condition accounting for the hemorrhage, and the more experience we have, the easier will it be for us to account for so-called uncontrollable hemorrhage. There was plenty of pathological evidence in this cervix upon which to base a diagnosis, and, perhaps, the case should have come to operation before.

Our future depends on our getting better clinical histories. We have perfect technic, and all of us can do operations well, but we are woefully lacking in the attention and accuracy that is necessary to obtain a good clinical history.

Dr. Hyde.—One point which interested me was Dr. Brettauer's use of fine twisted silk in the abdominal cavity. He told me it made him feel easier going home at night. He did not use catgut, for as he said, perhaps he did not know how to tie it as well as we do. I would like to know whether he has used catgut, and what has been his experience with it?

Another point that brought forth my admiration was the use of a towel clamped to the peritoneum and skin, to protect the abdominal wound.

The point brought out by Dr. Furniss in reference to the numerous assistants, is interesting. Dr. Brettauer had six assistants: One interne at his side, two internes opposite him, one at the instrument table, an anesthetist, and a sponge nurse. Are three assistants at the table necessary? Of all the operators I have seen, I believe Dr. Grant Baldwin is the one who can get along with the minimum amount of help.

These are the three points which interested me, and my statements are made not in the spirit of criticism, but as a reiteration of what I saw.

Dr. Brettauer.—I am grateful to you for your criticism and would be even more so if you had not apologized for it.

The use of a towel with which to clamp the peritoneum is not a very commendable practcie and will have to be replaced by a better method.

In the second case, I used catgut to tie with, and no silk at all, as this was an infected case.

One of the members has asked me whether I have any postoperative sinuses. I certainly do, but no more than any other abdominal surgeon.

I disagree with Dr. Furniss in regard to the first case. The trouble was not rigidity, but cough; there was a constant protrusion of the viscera into the operative field. The patient was not completely under until I closed the peritoneal cavity. I agree with him on the point of having too many assistants. I prefer fewer, but, gentlemen, we have on our service eight young men who want to learn and get as much out of their work as they can; if they are kept out of the operating room, they miss a very important part of their training. The junior simply holds the retractors, but he sees the wound, gets an idea of what is going on, and thus learns something. As a rule I prefer less assistance.

We have one hundred and seventy-five nurses detailed for three months each to the operating room; they must learn how to hand sponges, towels, etc.; this is part of their training.

In answer to Dr. Boldt's query about ultimate results, I cannot now give accurate statistics, but I do not find that on the whole my results are any worse than those of other operators. Sometimes I do not get primary union, but in the particular case referred to, I believe the woman was infected and the operation had to be done in a hurry.

I have changed from the median laparotomy incision, because of our dispensary report of the relatively frequent occurrence of hernia. I now open the abdomen to one side or the other of the median line.

Dr. Brickner.—I would like to add one statement to those of Dr. Brettauer. We have often had occasion to reopen the abdomen after the use of silk sutures, and have always found that the silk sutures no longer existed as such, only little ridges representing them being left in the tissues.

The case I operated upon yesterday, was one I would not have selected for such an occasion, for there were dense adhesions of the left parametrium and it required one-half hour's digging to liberate the enclosed structures. As to the diagnosis we were misled by the inadequate clinical history of the case. Dr. Frank treated the woman in the dispensary, and when her metrorrhagia did not cease, he sent her in. Pathologically, malignancy was suspected, but we were not sure.

One remark in reference to the small-sized incision made, has been called to your attention by Dr. Boldt. I have a small hand, and can, therefore, work where others cannot, so that I must take issue with Dr. Boldt on this point. I do not think I would have had more room with a larger incision.

I thank you for your criticism, and am sure we will all profit thereby.

DR. BARROWS GAVE A

CLINIC AT BELLEVUE HOSPITAL

on April 7.

DISCUSSION.

DR. CHILDS.—This amphitheater, one of the largest in the city, was evidently intended for lectures only, and the operator is placed at a great disadvantage in being obliged to face the light. Notwithstanding this handicap, however, Dr. Barrows worked very expeditiously, finishing his six cases in three hours. The patients were prepared just before entering the operating room by a thorough scrubbing with green soap washed off with water, and followed by alcohol and ether.

Dr. Barrows uses no bichloride, carbolic acid or tincture of iodine in wound preparation or during his operations.

This is thoroughly in accord with our own ideas. There is not, and there never was in surgery a practice so well deserving of extermination as the use of strong chemical irritants on the tissues, and we shall be glad to see it banished to the twilight of fable.

In his abdominal cases Dr. Barrows makes the entrance into the abdomen through, it seems to us, rather a long, median line incision. The patient is at first in the horizontal position; for the remainder of the work the Trendelenberg position is used. No. 2 plain catgut is used throughout for ligatures and sutures and in closing the abdominal wound, the only exceptions being the ligatures on the broad ligaments in hysterectomy where he uses a heavy twisted silk, and the skin incision which is closed with interrupted sutures of silkworm gut. Occasionally in work on the anterior vaginal wall and cervix chromic gut is preferred. Dr. Barrows claims 100 per cent. primary union in cases clean at time of operation. In all cases rubber gloves are used which have been sterilized by boiling, and are put on wet. The hands are prepared by the same method—soap, alcohol and ether—as the field of operation. The preliminary and after-care of the patients is simple, 3 c.c. pills the day before operation, and a calomel series begun on the third day after. The first dressing of the wound is done on the seventh day, and the patient is allowed out of bed on the tenth day.

In septic cases, where drainage is employed, it is always through the abdomen, and never the vagina. Rubber tube drains are used in preference to gauze. Gauze bolsters and strip gauze are used instead of laparotomy pads.

It is hardly necessary to us to speak of the excellence of Dr. Barrows' work, we need only say that it is such as might be expected from the skill, the training and the experience of so gifted a gentleman. It is therefore, with the greatest of pleasure that we now take up in detail, for your discussion, the cases operated upon before the Obstetrical Society on Monday afternoon.

CASE I.—A second degree tear of the perineum with moderate relaxation of the vaginal outlet. Slight rectocele and cystocele. The classical flap-splitting technic of Lawson Tate was employed. Three buried sutures of No. 2 plain catgut brought together the separated muscles, and four interrupted sutures of silkworm gut closed the skin. Time of operation, ten minutes.

CASE II.—Retroversion of the uterus without adhesions, and prolapse of the left ovary. Median line incision from symphysis to umbilicus, in the horizontal position, the patient afterward elevated to the Trendelenberg position. Dr. Barrows believes that the intetines drop ba k out of the pelvis better before they have been disturbed by handling or the introduction of laparotomy gauze. The round ligaments and infundibulopubic ligaments were shortened by loops, sutured with No. 2 plain catgut. On the floor of the peritoneal shelf, resulting from this shortening, an incision was made through which the prolapsed ovary of the left side was passed. The incision was then closed with two sutures of No. 2 plain catgut. Dr. Barrows stated that in this operaton (his own) the ovary does not rest on the anterior face of the broad ligament, but is still between the uterus and the tube.

The peritoneum was closed with a continuous suture of No. 2 plain catgut; the fascia with interrupted sutures of the same material; the skin was closed with seven interrupted sutures of silkworm gut. Time of operation, thirty minutes.

CASE III.—Retroversion with menorrhagia. Dilatation of the cervix with Hank's and Goodell dilators, curetage with sharp curet and the double curet of Sim's. Dr. Barrows laid particular stress on the use of this latter instrument for reaching that inaccessible position of the uterine cavity between the tubal openings. The uterine cavity was irrigated with saline solution through a Sim's-Polk-Burrage cervical speculum, and packed with plain gauze.

The round ligaments were then shortened at the external ring (Alexander's operation) through two separate incisions. Dr. Barrows cuts away the distal portion of the ligament, and sutures the remaining stump to the fascia with interrupted sutures of No. 2 plain catgut. The skin incisions were closed with four interrupted sutures of silkworm gut.

Time of operation 35 minutes.

CASE IV.—Median line incision from symphysis to umbilicus. The left ovary contained a 2-inch cyst, and was removed with its tube after ligating with No. 2 plain catgut—the stump was not covered. A small fibroid, 1 inch in diameter, was enucleated from the anterior uterine wall. Peritoneum closed with a continuous suture of No. 2 plain catgut, fascia with interrupted sutures of the same material, and the skin with seven interrupted sutures of silkworm gut.

Time of operation. twenty minutes.

Case V.—Median line incision from symphysis to umbilicus. Multiple fibromyoma of the uterus, patient forty years old. The uterus was uniformly enlarged to the size of a four months pregnancy and free from adhesions. The adnexa were normal. Extreme laxity of the broad ligaments allowed the delivery of the uterus through the wound, and after ligating the broad, round and infundibulopelvic ligaments with two large, twisted silk ligatures, the uterine arteries were ligated with the same material, and the supravaginal removal of uterus and appendages carried out. The cervical stump was covered with the peritoneal cuffs and sutured with No. 2 plain catgut. The abdominal wall was closed as in the previous cases.

Time of operation, thirty minutes.

Case VI.—Retroversion with adhesions. Transverse suprapubic division of the skin (Kustner incision) median line incision of the fascia. Adhesions of the fundus separated. Adnexa normal. Round ligaments shortened (Alexander) and wound closed as in the other cases.

Time of operation, thirty minutes.

Dr. Goffe.—Mr. President and gentlemen of the Society, having had the good fortune to see Dr. Barrows work at a Sanatorium with which we were formerly connected I expected to see good work at Bellevue, and was not disappointed. The organization of the assistants was perfect, for instead of the many as at Mt. Sinai, the contrast was striking by the presence of only one. The house surgeon passed the instruments while the nurse was ready with the sponges, the dressings, etc. Everything worked with the smoothness of a well-oiled machine. In regard to the anesthesia it also was satisfactory. The patient was relaxed, there was no voluntary motion, and no interruptions. Unfortunately, I could stay for only three of the operations.

As regards the bowel preparation for an operation, three C. C. pills are given the day before the operation as mentioned by Dr. Child. This results in great flaccidity of the intestines, and I am pleased to say I use the same treatment. Occasionally the patient is susceptible to cathartics and it is necessary to control the movements. The rule with me is to give one dose of paregoric after the third movement. No rectal irrigations should be used. The bowels are empty and flaccid.

Pertaining to the field of operation, the parts are shaved as usual and a wet dressing of plain water applied until the patient gets into the operating room. Then she is scrubbed with green soap and water; then with alcohol and ether, but simply to get rid of the soap. No chemicals are used; no bichloride, no tincture of iodine, and nothing further. Under these conditions Dr. Barrows said, he expects 100 per cent. of primary union in clean cases. This preoperative preparation will doubtless strike you as an abnormal reversion to Lawson Tait's technic. At present few of us are ready to risk it.

As regards the surgeon, he washes his hands in green soap rinses them in sterile water and puts on wet gloves in sterile water. Dr. Barrows defined dirt as "normal substance misplaced." "When powder is misplaced in gloves it is dirt"—Dr. Barrows criticized its use, and for this reason I mention it. Dr. Barrows criticized the dipping of the arms into long vessels containing chemicals. He says sooner or later it means dirt, and contamination, the water becoming an "epithelial soup." If this be true how much more pointedly does it apply to the contents of his wet gloves which if punctured during a laparotomy would discharge their sweated "epithelial soup" into the wound or abdominal cavity? The doctor's ease and facility in handling instruments and conducting his work is beautiful; there was no apparent hurry yet everything was done with the greatest dispatch. There was nothing to repeat, there was nothing to undo—every movement had its own significence.

The first case was one for a secondary degree of perineal laceration. I would like to know whether or not Dr. Barrows considers this a muscle operation? A transverse incision was made—the vaginal wall was lifted up and part of it snipped off. Three interrupted sutures were taken and nothing more was done to bring the levators into view. This is a great contrast to the usual muscle operation, where the muscles are stripped off their fascia and cellular tissue and clearly individualized before suturing.

The second case was for the relief of a large prolapsed ovary in the culdesac. Dr. Barrows accomplished this with his own individual method. He called it a "shelving operation." According to his own criticism, this means putting on a shelf and going out of commission. The doctor made a shelf of the mesosalpinx, the tube was lifted up, the mesosalpinx was transfixed—the ovary pushed through it and the round and broad ligaments shortened. My criticism is that Nature does not provide any shelves, but suspends all organs by ligaments. The round ligaments were shortened, "not to hold the uterus, but the ovary"; however, a retroversion was present here, and to me the two conditions are interdependent.

So much for what I saw of the surgical technic! There is another aspect of this clinic of which I desire to speak.

The operator opened the exercises by announcing that this was his regular Wednesday clinic for the medical students of the university, that he had made no unusual preparation and would conduct it along accustomed lines. The students were present in their seats. There was suggested therefore the responsibility of the medical teacher to his students. To me this is a serious question and especially so at this age of reckless and irresponsible surgery. If ever there is a time in a surgeon's life when he should approach his task with a sense of serious and sacred responsibility it is when he stands in the presence of a patient rendered unconscious and awaiting the incision that means for her health or morbidity, it may be life or death. This is the attitude that should be impressed upon the student not only by word but by a pervading atmosphere of seriousness. At this clinic there was to me an attitude on the part of the operator—I will not say of frivolity—but of jaunty nonchalance entirely foreign to the occasion especially in the presence of medical students.

Surgery must be kept on a high scientific plain if we are to combat successfully the tendency to commercialism, so rife to-day. To characterize a surgical procedure as "a good bread-winner" which I have heard on more than one occasion hardly attributes to it those scientific qualities that should be impressed upon the student's mind. As teachers we cannot be too punctilious regarding even such minor details.

Dr. Coe.—It may be strange that I have been at Bellevue for sixteen years, and this was the first time that I had seen Dr. Barrows operate, or had had an opportunity to observe his technic. We are peculiarly unsociable at Bellevue and every surgeon must work out his own salvation. You must all be impressed by the smoothness of Dr. Barrows' operations. Our amphitheater impressed Dr. Goffe as being badly arranged for light, but the impression would have been much deeper if he had seen a difficult operation performed on a dark day in winter. Sometimes, the patient has to be turned toward the window on account of the poor light, and often the anesthesia is pretty poor. Personally, I am opposed to operating before a general clinic. At my section-classes there are present six or eight students who examine the patients and ask questions, and have an opportunity to see the steps of the operation. This is the only way to learn, and it took me ten years to convince our faculty of this fact. We must come in personal contact with the students, otherwise, we fail to make much impression on them.

We must impress the students, not so much with the operation, but with the method of washing their hands properly. They use soap and water, then lime and soda, then dip in lysol; therefore, we cannot attribute sepsis in a patient to the examination by the students. We take only two cases at each clinic, although I believe one is the proper thing.

I have given up the use of plain catgut for the suturing of the fascia on account of the tendency to hernia, and now I use only kangaroo tendon or chromic gut. I have reopened the abdomen following two or three days after an operation, and have found the fascia ununited. We believe that plain catgut is not absorbed until ten days, but this is not always so. I happen to have seen three cases in which the wound burst open from vomiting.

A prolapsed ovary alone, I do not regard as an indication for laparotomy. Usually, however, complications are present, which require such a procedure.

Dr. Studdiford.—I would like to make one criticism in regard to a procedure at the clinic which I think is very objectionable. All cases but one were prepared outside the operating room—the patients were brought in draped. It seems to me that in a prolonged operation the amount of water poured over a patient, wetting the blankets, sheets, etc., is very objectionable for the patient. In our service at the hospital we scrub the patient thoroughly in the ward the night previous to the operation, or that morning, with soap and water, alcohol and ether, then a half hour before the operation we paint the field with tincture of iodine and place a sterile towel over it. The patient is then brought into the operating room and just before the operation a second painting of iodine is given. While Dr. Barrows' results are good, I think our procedure is a better one.

Dr. Taylor.—In regard to the preparation of the patient, I use the same method as Dr. Barrow, except with regard to the use of iodine. It is not safe to pour ether on the abdomen, not on account of chilling the patient, but for fear that it may blister the skin of the back by running around. There were two things with Dr. Barrows' clinic of which I wish to speak. The first, was the absence of a complete history—whether for students or graduates, detailed gynecological data are absolutely essential, and without it, one cannot cover the entire ground. Secondly, the examination of the patient under anesthesia should be a routine procedure, except, perhaps, in exceptional cases, as an ectopic, etc. The operator owes a good, clear-cut examination under anesthesia to himself, his patients and his students, otherwise, he may make mistakes in diagnosis more frequently.

As regards the amphitheater, I believe that the amphitheater of the future will not have long rows of seats—these must be abolished. At Roosevelt Hospital, where I work, we have two operating rooms where clinics are held, the Syms and the McLane; the latter, having a railing, situated near the operating table, where the students stand and can really see what is taking place, is in my opinion more desirable than the Syms which is much larger but the students further from the field of operation.

Dr. Ward.—Dr. Barrow's operation of transposing the ovary on the anterior surface of the broad ligament for prolapse interested me very much. In this buttonholing of the ovary, the doctor emphasizes the importance of making a shelf and he shortens the round and infundibulopelvic ligaments. I think the last step is unnecessary and a mistake, as it is liable to cause an obstruction and constriction of the ovarian veins with the resultant damming back of blood on the pampiniform plexus, thus giving rise to a condition of varicocele similar in symptomatology to that presented in the male. I have had a large experience with this operation and it has been very satisfactory in its results. I have frequently employed it in cases of varicocele without prolapse, thus supporting the ovary just as the testicle is supported with a suspensory bandage.

Dr. Barrows does not take out the appendix, or even look at the gall-bladder, I think it would be for the best interests of his patients if he did.

Dr. Barrows.—I am greatly obliged to you for your friendly criticism. I am afraid I did not show Dr. Goffe very clearly the perineal repair. Unfortunately it was very difficult for one sitting where Dr. Goffe sat to see the field of operation clearly. The incision was not a simple transverse one, but a "U"-shaped incision broadly exposing the muscles and torn fascia on both sides. My experience has taught me that it is wiser not to attempt to dissect out the muscular fibers, but to bring together the torn muscles and fascia which have become welded into one in their retraction.

I said that matter out of place was dirt, and that powder on gloves was dirt, and certainly out of place in wounds or in the peritoneal cavity.

The "epithelial soup" to which I referred was the result of the dipping of the hands and arms of various operators in the various solutions employed by many surgeons—I can conceive of no circumstance under which the same water could be used twice or by more than one person with safety or satisfaction.

The question of the punctured glove is surely not apropos to this. In such a case the escaping powder would surely be of more danger in a wound than sterile water which possibly might be left in the glove when put on.

As I stated, the clinic was the regular Monday afternoon gynecological clinic of Cornell Medical College. The clinic was given for the purpose of illustrating the method of preparation and the technic of operative procedure employed in the Cornell Gynecological Division in Bellevue Hospital. The surgical technic I was particularly desirous of showing, and specially what ease and facility in operating could be attained by a most competent and well-drilled staff of assistants, and, above all things, a simplicity of technic.

With this purpose in view I did not think it advisable to go into the histories of such cases as lacerated perineum, uterine fibroids, prolapsed ovaries, posterior displacements, etc. These cases speak for themselves.

I may say that the students are familiar with the histories of all the cases operated upon. They come in close contact with all of our gynecological cases during the last year of their medical education. They are divided into sections of, say, ten students, and are required to examine practically every case operated upon, to make a diagnosis, and to suggest a plan of treatment. For a large part of this last year they serve as clinical clerks in our wards, taking the histories of the patients, making physical examinations, as well as microscopical examinations of the blood and secretions and excretions, and carrying out the daily routine of treatment before and after operation.

They see the cases operated upon in our private operating room, which affords every opportunity for close observation. Because of the rules of the hospital, we are obliged to give the Monday clinic in the general amphitheater, where the opportunities for seeing gynecological operations are not good, as has been pointed out by several speakers.

The preparation of the patient we believe to be of the greatest importance, and the field of operation is prepared by the house gynecologist himself, and not relegated to a nurse, or one of his assistants.

If Dr. Studdiford had been looking closely, I think he would have seen that the patient was well protected by rubber sheets and a Kelly pad. If these were omitted it was the fault of the inefficient nurse that Dr. Coe declined to operate with, and who, unfortunately, fell to my share.

Regarding the operation for prolapsed ovary, I have called it "shelving" for want of a better name. It is not a good name, because shelving suggests the idea of putting out of commission, while this operation puts the ovary into commission, many of these cases conceiving and bearing children after operation.

In the case where Dr. Goffe refers to my inconsistency, I was not at all inconsistent, because I tried to make it quite clear that the shortening of the round ligaments within the abdominal cavity was not done to correct the slight retroflexion from which the patient suffered (she had no retroversion) but to make a shelf for the ovary. Dr. Goffe says nature provides no shelves—surely he cannot ignore the pelvic shelves which Polk drew our attention to so many years ago, and I cannot, myself, conceive of a more wonderful shelf than the female perineum.

Dr. Vineberg gave a

CLINIC AT MT. SINAI HOSPITAL

on April 18.

DISCUSSION.

Dr. Braun.—The things that impressed me most at Dr. Vineberg's clinic were the following: We were given freshly laundered gowns out of a bag, so that there was no opportunity for the collection of dust upon them, an admirable and far better procedure than having the guests get them from a peg on the wall. In being ushered in on the floor the gauze and dressings were splendidly protected from being contaminated by the guests who were walking about. The instrument table was also protected by sterile cloths. I also noticed that the suture materials, catgut, silk, and needles were kept in large trays of alcohol.

As to the first case, it was a small ovarian cyst. Dr. Vineberg went into the history carefully and made a correct diagnosis. The patient was painted with full strength iodine on the table. She had received no previous preparation, except a dry shave in the ward. The abdomen was opened; the ovary and tube on the other side being found to be normal, the diseased ovary with its cyst was removed *in toto*. The appendix was normal, but was removed. It was tied off with plain catgut, the stump was cauterized with carbolic acid and alcohol and was dropped back into the abdomen without invagination. When not pressed for time I personally prefer to invaginate the appendix; however, I recognize that the doctor has an abundance of authority for his method of making the stump. I noticed further that no masks were used by the staff. Personally, I feel that it is more thorough for the assistants and nurses to wear masks.

In closing the abdominal fascia, interrupted chromic gut was used. This I believe is admirable technic. Some years ago I looked up statistics referable to the rupture of abdominal wounds. In a collection of some 200 cases many interesting facts were brought out, the chief one being that no matter what suture material was used, there was a possibility of rupture under conditions. It was also established that ruptures occurred more frequently when nonabsorbable sutures were used than with absorbable sutures.

I was much pleased to see large harness rings attached to the abdominal pad. We do the same at the Woman's Hospital, and thus avoid all danger of leaving any pads in the peritoneal cavity.

As regards the second case, it was one of complete procidentia. The doctor evidently sacrificed himself on the altar our society had erected for him. For the purpose of operative material the patient was brought in the afternoon of the clinic without any previous rest, presenting a large procidentia and erosion of the posterior lip with edema of the anterior vaginal wall. The bladder was separated with difficulty on account of the edematous condition of the anterior wall. Finally, however, this was accomplished, and the uterus being delivered a double hydrosalpinx presented. Both tubes and the left ovary were removed and part of the right. An interposition operation was done, the fundus was brought up well under the symphysis, the sutures being admirably placed. The large eroded surface was left until the last before amputation was done. This I think was wrong, for it left a chance for contamination, and I believe it would have been best to have done the amputation first and personally I think it should have been made higher up, so as to lighten the uterus and get a better stump. A perineorrhaphy was done afterward, and in the complete operation for the sphincter, the operator used silkworm-gut sutures, depending on the coaptation of the ends of the sphincter muscles. I think it would have been better to have pulled out the ends of the muscles and then coaptated and sutured them.

Dr. Polak.—Dr. Broun has covered practically all the points about the operating room. There are, however, three points of which I desire to speak. One in regard to the multiplicity of asisstants. I do not approve of it for the reasons enumerated before. Secondly, in regard to the house officer handling instruments, threading needles, etc., I believe this hinders the operator, and that nurses are better for this kind of work. Thirdly, in regard to the operation, I was only fortunate enough to see the procidentia case. In doing an interposition operation, one must bring the uterus well forward, and the cervix must be well back in the hollow of the sacrum. The doctor defeated his own purpose here by amputating the cervix at the point at which he did, for he had much cervical tissue left and could not accomplish what I have just spoken of. As regards the pelvic floor, I did not see Dr. Vineberg bring out the levatores ani.

I must make the same criticism about the operation on the sphincter as did Dr. Broun. Too much tension was put upon the sutures, resulting in strangulation of tissue. Otherwise, the procedure was well done, the technic was well nigh perfect, and all emergencies were met as only a master can meet them.

Dr. Vineberg.—The proper keynote has been sounded to-night, in that the criticisms were free and frank. It is only in that way we can derive benefit from such a plan as we are following. I am sure I have learned a great deal from the comments made on my work of to-day. In diagnosing the first case, I stated the clinical history pointed to ectopic, but the local finding was so definite that I did not hesitate in making a diagnosis of cyst of the ovary, which it proved to be.

I have taken note of what Dr. Boldt has suggested, that is, even when the entire ovary seems to be converted into a cyst, one can usually find a thin layer of ovarian tissue at one pole, which may be conserved, in the event of both ovaries being similarly affected. That contingency did not arise in this instance, as the other ovary was perfectly normal to the naked eye and was left *in situ*.

As to the treatment of the stump in the removal of the appendix. The method I followed is the one in general use in Mt. Sinai Hospital and we have had at least 5000 cases without, as far as we know, any untoward event from the method. I do not believe it is good surgery to imprison stumps, whether it be of the appendix or ovarian or uterine vessels, with the surrounding tissues; the ligature usually embraces. The ligated stump usually sloughs and I would rather have the resulting slough free in the peritoneal cavity, where it will be readily absorbed, than imprisoned in a limited area, where it may give rise to local infection. I have observed several instances in which such an imprisonment of the uterine vessel stump has given rise to temperature 103–104° F. for several days, following a supravaginal hysterectomy.

Dr. Vineberg.—No one has criticized me about the second case as much as I have myself. The case was a very unfavorable one, but I did not want to disappoint you gentlemen. There was such edema that even with three or four weeks preliminary treatment, the case would still have been a difficult one to operate upon. In regard to leaving the cervix to the last, I find it best and most convenient, and it aids me in my work. I did not have to pass a sound for I had the uterus before me.

About the low amputation, some men do not amputate the cervix at all; if I went higher up I would have had to tie off the uterine artery, and this I believe would not have been advisable. The Tait operation I rarely do, only where there is a complete tear of the sphincter without any rectocele. I did not have to denude very much tissue, for the rectocele was very slight here and it was entirely unnecessary to bring the levator ani together. That in my mind would have been bad surgery in that instance.

I have never had any but good results from this method, except, sometimes, a small fecal fistula. I think the Tait operation is best in such instances, and that one gets better results by taking the fascia and muscle together rather than suturing the muscle fibers separately.

In reference to dilatation, I did not understand Dr. Curry's remarks, for here the ends are retracted and how can one catch them?

(Answer by Dr. Curry—Insert index fingers and stretch the sphincter.)

I believe rapid work should be associated with carefulness. This is a rare gift, and my observation is that most men who do rapid work do slovenly work. I try to impress upon my assistants that it is better to take from ten to fifteen minutes longer so as to leave the field dry and aseptic, and that this gain is greater to the patient than the harm that may accrue to the patient from being under the anesthetic five, ten or fifteen minutes longer.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OBSTETRICS AND GYNECOLOGY.

Meeting of April 24, 1913.

GEO. GRAY WARD, JR., M. D., *in the Chair.*

ECHINOCOCCUS CYST OF THE LIVER.

DR. HERMANN GRAD.—This disease is rare in America and it will be of interest to review briefly the manner in which this tapeworm reached the human being. The disease is caused by the larvæ of a tiny cestode, the Tænia Echinococcus, which infests the dog. This cestode was only about 5 mm. long, and had only three or four segments. The last segment was sexually mature and contained about 500 eggs. From the intestine of the dog the fertilized eggs were passed along with the excreta. The segments were covered with mucus by which they adhered to grass and other substances upon which herbivora fed. Thus the ova reached the alimentary canal of the host, either in mass enclosed in the proglottides or swallowed with drink or food as separate eggs. Each ovum consisted of an embryo enclosed in a thick fibrous capsule, which served to protect it from injury and enabled it to retain its vitality for a considerable length of time. In the stomach the fibrous capsule was digested by the gastric juice and the embryo thus liberated. The freed embryo was capable of boring itself into the walls of the stomach without any difficulty and without causing serious local injury to the tissues which it had pierced; it might thus reach the systemic circulation and be carried to any part of the body. As a rule they were stopped by the liver, having reached that organ by the portal circulation. Having reached a stationary position in some solid organ the embryo began to develop by a process of growth and metamorphosis into the characteristic bladder cysts, the so-called hydatid. The cysts might be found growing in the liver, respiratory organs, peritoneum, circulatory apparatus, brain, spinal cord, spleen, kidneys, and suprarenals, in the substance of muscles, subcutaneous tissues, medullary cavities of bone, in the orbit of the eye, in the breast, axilla, scrotum, ovaries or uterus. Statistics showed that in Iceland, where the disease was very prevalent, in 69 per cent. of the cases the echinococcus growth was found in the liver. The lung was affected in about 11 per cent. of the cases and the peritoneum came next in frequency. Echinococcus hydatids had been found in cattle, in sheep, horses, pigs, kangaroos, in the camel, ass, zebra and in the monkey. As to what became of the embryo after it had lodged in the tissue, it was observed experimentally that the liver under its serous surface, four weeks after feeding a pig with fertilized ova, was studded with small points resembling tubercles. These tubercles were cysts containing a homogeneous transparent capsule, with coarse granular contents. If the examination was made eight weeks later, the cysts of the surface of the liver would be found to be of double size and the hydatids would look like clear drops. At this early stage the hydatid was really a bladder which collapsed on being pricked with the escape of a transparent fluid. In some places the cells had a definite arrangement, the larger cells lying mostly internal and having a clear nucleus and a stellate ramification. If these cysts on the liver were examined at the end of nineteen weeks they would be found to have attained a diameter of 12 mm. They were situated beneath the peritoneal covering of the liver, pushing the covering before them so that they could be only partially embedded in the liver substance. While certain changes were in progress in the hydatid cyst, the little capsule in its endocyst underwent changes and developed other cysts, the so-called daughter cysts. When the daughter cyst had attained its full development, small vesicles formed on its inner surface called brood capsules which gave origin to characteristic heads or scolices. The limit of growth of the hydatid cyst had not been experimentally determined, but a cyst of this nature might attain to such a size that its further development was arrested by the death of its host. On the other hand a cyst might retain vitality for many years even when the growth had remained stationary. There was a case on record of a cystic tumor of the neck which had been known to exist for forty years, and when it was opened a large number of hydatid cysts were evacuated and a great number were apparently living. The growth of the hydatid cyst was, as a rule, quite slow and increased in size in the position of the organ attached. They grew rapidly and attained considerable size in those parts of the body where the greatest space for growth was afforded. When they grew from the under surface of the liver they attained great size as the intestines were easily displaced. A cyst developing in the brain brought death to the host before it attained a great size. A hydatid cyst might be found dead at any stage of its development. The cyst contents might be found degenerated into a solid caseous mass, showing also amorphous débris and hooklets under the microscope. A hydatid cyst might become converted into a circumscribed abscess.

The process of degeneration rendered these parasites inert. Cases were on record where hydatids of the lungs had undergone calcareous degeneration and gave no pulmonary symptoms during the patient's life. The causes of degenerative changes as seen in many cysts were not known, but the process of decay and subsequent quiescence might be the result of overcrowding of the daughter cyst. The real explanation was probably to be found in the structural changes which the fibrous capsule underwent which affected the blood-vessels of the covering and caused disturbance of the nutrition of the cyst wall and contained progeny. A great many animals had been experimented on to find whether the tænia would develop in them, but in none had tænia echinococcus been found except in dogs.

An urticaria-like eruption sometimes followed the tapping of a hydatid cyst, more especially those situated in the abdominal cavity. It usually made its appearance a short time after puncture and lasted from two to three days. It had been known to appear independently of any operative interference and cases had been known to have had rashes of this kind ushered in with an attack of giddiness and sometimes vomiting. No satisfactory explanation as to the cause of the rash had yet been advanced. Alarming symptoms had been frequently observed to follow the tapping of the cyst, when there was reason to believe the fluid had gained entrance into the blood stream. There was a fatal case on record where, on autopsy, it was found that a trocar had pierced the hydatid capsule, transfixing a large vein, and the fatal issue was attributed to the fact that on the withdrawal of the trocar the fluid had gained entrance into the portal vein.

Cases with a fatal issue following simple puncture of the cyst had nearly always been confined to punctures of the abdominal cavity, except in one case where the tapping of a pulmonary hydatid caused death from flooding of the bronchi which followed the rupture of the cyst.

The pathologist's report on echinococcus cyst of the liver showed that it held almost a quart of fluid and that the tumor was of irregular size with a ragged surface, and hemorrhagic. The inner surface was yellowish, fairly smooth. The wall was composed of dense hyaline membrane of several lamellæ. Several daughter cysts containing gelatinous numerous white bladder like opaque daughter cysts with elastic walls were present. Microscopically, the contents showed the characteristic scolices with rosettes of hooklets, cholesterine crystals, and droplets. The microscopical examination of a section showed the lobules of hepatic tissue surrounded with dilated bile ducts, the whole being infiltrated with pus cells and hemorrhage.

The history of his case of echinococcus cyst which Dr. Grad wished to report was as follows: The patient was twenty-four years old and seen for the first time February 4, 1913. She had been married one year and had a baby ten weeks old. She had been ill about three years and complained of pain in the upper abdomen with attacks of indigestion and a general feeling of illness. About two years ago she became jaundiced. She had been at a hospital before and cholelithiasis was diagnosticated; this diagnosis was confirmed, so she stated, by an *x*-ray picture. Those who saw the plate were able to make out shadows of the gall stones.

The examination showed her to be a well-nourished woman, somewhat anemic. In palpating the upper abdomen, an ill-defined resistance was felt in the epigastric region. Pressure on this region elicited pain, not very severe in character, but more of a soreness. Percussion over a line drawn from the umbilicus to the free border of the rib on the right side caused pain. Percussion did not show an enlargement of the liver. The lower pole of the right kidney was palpable. Nothing abnormal was felt in the left hypocardiac region, nor was the left kidney palpable. Bimanual examination of the pelvis proved negative. A diagnosis of cholelithiasis was made and operation advised. A cough which appeared to be dry in character, very persistent, not yielding to ordinary medication, was present. Phlegm was never raised.

The patient entered the hospital on February 23 and was prepared for a cholecystotomy. Upon opening the peritoneal cavity we were surprised to find a tumorous mass situated under the dome of the diaphragm; it was adherent to the left kidney, as well as to the spleen and to the spinal column. Further examination showed the gall bladder to be normal and that the large masses were intimately connected with the left lobe of the liver. The adhesions were friable and easily severed. It was decided to enucleate the mass, although the diagnosis was not clear at the time of operation. The trocar brought forth a small quantity of clear fluid; in withdrawing the cannula, a small echinococcus bladder protruded through the aperture, which gave, of course, a clue to the diagnosis. For the first time we knew we were dealing with an echinococcus cyst of the liver.

An enucleation of the tumorous mass was proceeded with. In severing the growth from the liver structures a very sudden and alarming hemorrhage set in which was controlled only by a through-and-through suture of the liver tissue. The peritoneal tissue was unavoidably soiled with cystic fluid. A great number of echinococcus bladders were evacuated, hundreds of them.

The patient stood the operation poorly, being in considerable shock and she required an immediate intravenous injection of saline solution. She reacted within two hours. The following morning her respiration was 42, pulse 150, and temperature 102. The respirations were mostly in the upper part of the chest, there being little or no diaphragmatic breathing. A tank of oxygen was used, the gas bubbling through a 50 per cent. alcohol instead of plain water. It was of great interest to see how well the administration of alcohol and oxygen succeeded. She gained great relief from this and this was used for three days at short intervals. She made a complete recovery.

MULTIPLE NEOPLASM.

Dr. Porter Flewellen Chambers made a report of this case which was read by Dr. Grad. The patient was admitted to the Woman's Hospital January 18, 1909. She had been married twenty years and was forty-two years old. She never had any children but had an indefinite history of having had one miscarriage. During the past few months she noticed a sensitiveness of her left breast; a small mass was palpable here but there was no enlargement of the glands, no retraction of the nipple, and no shooting pains. In view of the symptoms, she was advised to submit to the removal of this small mass in the breast. On January 19, 1909, this mass was removed as well as the surrounding healthy breast tissue. From a frozen section, the pathologist reported a condition of chronic mastitis.

During the summer months the patient noticed again a sensitiveness in her breast that had been operated upon. The pathologist disclosed the fact that a more careful examination of the specimen pointed to a suspicion of malignancy. On November 30, 1909, a Halstead operation was performed on the left breast.

On December 10 she developed severe abdominal pain on the left side which lasted about four days. There was no rise in temperature, no leukocytosis, but examination disclosed a fibroid of the uterus and adnexal disease. One month after the operation she was discharged.

The breast contained a few hard nodules which were scattered throughout the gland. The muscles apparently were not involved. The axillary nodes were slightly enlarged and hardened. Carcinoma of the axillary glands was the diagnosis.

The patient was readmitted to the hospital three weeks later and in a very nervous condition. She complained of pain in her tongue on the left border and a puffiness of the supraclavicular region. She was referred to Roosevelt Hospital in order to receive Hodenpyle's injection intravenously, which greatly aggravated her nervous condition, and also the peculiar feeling in her tongue.

She was readmitted to the hospital for the fourth time July 25, 1910. The following day she was operated upon for a uterine fibroid; there was also done a double salpingo-oöphorectomy and appendectomy. A urethral caruncle was also removed. An afebrile recovery followed the operation.

The pathologist's report on the removed fibroid was of considerable interest. The uterus was 5 cm. long, 5 1/2 cm. wide, 2 1/2 cm. thick, with mural and subserous fibroids. The cavity was 1 cm. deep, the endometrium was congested, and the diagnosis was made of uterine fibroid myomata, one fibroid degenerating, and chronic appendicitis.

One and a half years after her last operation, December 2, 1912, she was admitted to the hospital with a tumorous mass in her right breast and a palpably enlarged gland about an inch below the center of the right clavicle. This breast was removed and all suspicious masses were enucleated.

The microscopical examination of the breast showed dense cicatricial tissue penetrated by long rows of vascular cells with many mitoses. These sometimes occurred in sheets, mingled in the connective tissue and were seen to have delicate protoplasmic polygonal processes. There were regions where their origin from epithelial tubules was detected. One lymph node was permeated with similar sheets within the lymph sinus. A larger node had an entirely different histology, being composed of spindle cells with many mitoses and of giant cells. Both had large amounts of cytoplasm and delicate fibrils of intercellular substance could be seen. A diagnosis was made of mixed cell sarcoma of intraclavicular node and scirrhous carcinoma of breast. The patient was discharged from the hospital December 23, 1912, and readmitted January 15, 1913. The wound of the right breast had entirely healed, but she had a tumorous mass on the top of her left shoulder and a similar mass in the abdominal wall. Both masses were removed under local anesthesia. The pathologist reported that the specimen was a mass of dense mostly parallel spindle-shaped elements, replacing the primary tissue completely. There were several lumina of blood-vessels in the tissue, but no certain relationship with them could be ascertained. The spindle-cells reminded one somewhat of smooth muscle fibers with large nuclei and little protoplasm, characteristic of tumor cells. A diagnosis of spindle-celled sarcoma (muscle cell) of metastatic origin was made. The patient left the hospital in a good general condition and her attending physician reported that general sarcomatosis of the skin resulted, from the effect of which she died on February 22, 1913.

This was a patient who had multiple neoplasms. She had first a carcinoma in her left breast; then a degenerated fibroid of the uterus which very likely was sarcomatous in nature; then a carcinoma of her right breast; then a general sarcomatosis of the skin.

PROFUSE INTRAABDOMINAL HEMORRHAGE WITHOUT EVIDENT EXPLANATION.

DR. LE ROY BROUN reported the case of a woman, forty-five years old, single, who had menstruated with a fair degree of regularity, the length of time being from five to six days. When a child she had profound anemia and only flowed for a day at a time and occasionally with a great deal of pain. The anemia continued for fully fifteen years, during which time she was unable to even go upstairs except with violent cardiac attacks. The hemoglobin must have been unusually low since she stated that on injury the blood was watery, thin and sticky. At the end of fifteen years the percentage of hemoglobin increased, her menstruation tbecame regular. When the patient was first seen January 3, 1913, she was in a state of extreme collapse with every evidence of internal hemorrhage. The pulse was hardly perceptible and not over 90. There was a marked abdominal distention especially below the umbilicus. A vague feeling of the presence of a solid tumor was present on the right side but was not distinct on account of the fluid contents of the abdomen. Vaginal examination showed nothing. The hymen was unruptured.

The history given was that this was the time of her monthly sickness; she commenced menstruating on the morning of the third; nothing occurred or was done. About 7 o'clock in the evening she was suddenly seized with violent colic which was so severe that she at once sent for her physician, who promptly came and prescribed a uterine anodyne and stated that he would return. This he did in an hour. The patient had rapidly changed for the worse and in every way gave indications of profuse hemorrhage and severe shock. Dr. Broun saw the patient immediately after. The patient was sent to the Woman's Hospital with instructions that everything be made ready for operation. On seeing her at the hospital immediately after her arrival it was thought that there was a change for the better in her pulse and operation was deferred with instructions that she should be seen every half hour; if she continued to improve the operation would be postponed; if not, the operation would be done at once. Her condition steadily improved. One week following multiple fibroids of the uterus largely within the pelvis could be easily mapped out. The distended condition of the lower part of the abdomen had disappeared. The pulse had become full and normal.

On January 9, an abdominal section was performed. In the abdomen was fully a pint and a half of thick blood. The amount primarily present was evidently much larger, the watery element having been largely absorbed. The blood that was present was over the entire abdominal contents and was not in any way encystic; while a large portion was in the pelvis it was found in every space and up over the diaphragm. This blood was carefully removed and a search made for the original focus. Both ovaries were normal in size and did not give any evidence of atypical condition. The tubes were normal. At the posterior wall of the multiple fibroids of the uterus was an ecchymotic condition of the peritoneal covering of the uterus extending over an area of some 2 inches in scale. A supravaginal hysterectomy was done. The tubes and ovaries were left and there being no positive evidence of the hemorrhagic focus existing in the pelvis, the incision was extended and an examination was made of the entire intestinal tract with negative findings in every respect except in the mesentery of the appendix. In the location of the appendix was some exudative lymph. On manipulating the mesentery of the appendix a minute opening was found in the vein which passed through the mesentery to the appendix. The patient's recovery was uninterrupted with the exception of some plastic peritonitis as a result of the handling of the intestines.

This case was reported without any attempt at explanation since none other than what would be theoretical could be offered. There was, however, an absolute absence of any indication of the hemorrhage having originated from a ruptured corpus luteum. The blood pressure was 150. The examination of the urine was negative.

CARCINOMA OF UTERUS WITH PARAMETRIC TISSUE.

Dr. Le Roy Broun exhibited a specimen on account of its interest and the possibility of bringing out a discussion on the present manner of removing as much of the parametric tissue as possible. The patient was forty-nine years old, the mother of seven children, all with normal labors. She presented herself on January 20 with a history of having had pain in the pelvic region for the last four years; this pain was aggravated by exercise and on standing. Recently the pain had gotten worse, especially at night when in bed. For the past five years she had hysteroepileptic attacks. She had been having irregular uterine bleeding and her last period was on January 4. Examination showed a bad laceration of the posterior vaginal wall and bleeding from the uterus was present. Preliminary curetage at the time of operation gave what was evidently a malignant disease of the uterus situated above the internal os. The radical abdominal operation was performed. The field of operation was closed after the Bumm method. The patient's recovery was uninterrupted with the exception of the inability to voluntarily pass her urine for at least three weeks.

The uterus with both appendages attached was sent to the pathologist. The uterus measured about 10×1/2×5 cm. The cervical canal, far above the internal orifice, was taken up by friable foreign tissue, which excavated and infiltrated to some extent the cervical wall. The uterine musculature was hypertrophic and edematous. A vaginal cuff, 3 cm. wide, and large pieces of parametrium were attached to the uterus. The growth had replaced the vaginal portions of the cervix. There were signs of cauterization on the line of the vagina. The appendages did not show any particular changes. Section showed strands and solid lobules of a carcinoma composed of regular cells of epithelial origin.

In removing the parametric tissue Dr. Broun believed that this could best be accomplished by exercising strong downward traction on the uterus, the ureters having been completely isolated. If the Bumm technic was completely followed out, the chances of getting out a large amount of parametric tissue was materially added to after the vaginal tube had been cut across. If this method was not utilized but the Wertheim technic followed, here again with strong upward traction, the use of the parametric clamp greatly facilitated the removal of the tissue.

CARCINOMA OF THE APPENDIX.

Dr. Emil Schwartz showed a series of slides of appendix carcinoma which demonstrated a few unusual features. The first specimen was removed by Dr. Pinkham and showed in the gross specimen a thickened tip and a dilated proximal portion. Considerable mucus escaped from the lumen. The serial sections showed that the entire mucous membrane has been destroyed. No traces of Lieberkühn crypts and no lymph follicles could be found. Instead of the normal submucosa there was a dense sclerotic scarry layer upon which a straight line of high columnar epithelium in a secreting stage was resting. The section further down showed a wavy high columnar epithelial layer; the cells were arranged in several layers above each other. The tip was solid and contained the plexiform strands of polyhedral cells which were found usually in this form of a carcinomatous appendix. The schematic drawing which followed the demonstration of the slides described above illustrated the resemblance of the cells filling the bottom of the Lieberkühn crypt, with those forming the carcinoma. Lubarsch, who first described the so-called small carcinomata of the jejunum, a condition analogous to this form of carcinoma, also showed a drawing similar to this one in order to prove the origin of the carcinoma cells from the Lieberkühn glands.

ADENOMYOMAS.

This series of slides DR. SCHWARTZ said were remarkable on account of the comparative rarity of the cervical, that was the proliferation of the cervical glands into the uterine musculature as far outward as the serosa peritonei. The musculature (in the gross specimen) measured about 4 cm. in width. The diffuse hypertrophy of the muscular wall, which resembled an actual tumor, distinguished the adenoma from the adenomyometritis section of Robert Meyer. The special features of their sections were the mass-like invasion of cervical glands into the musculature and the proliferation of the glands into a well capsulated regular myoma. In spite of this excessive glandular growth and the likeness to the adenoma these diffuse adenomyomata had to be called benign, although in some cases the rectal wall was invaded by these glandular structures. After the removal of these tumors there was no recurrence and no distant metastasis could be observed. This condition was regarded by Recklinghausen as a tumor of the Wolffian body like other pathological findings in the tube and tumors in the hilus of the ovary. At the present time most of the authors derive these glandular structures from the uterine mucosa glands and the fact, shown in the section, that the cervical glands presented different pictures from those adenomyomata in the region of the corpus uteri, spoke in favor of the latter opinion.

KRUCHENBERG TUMOR.

DR. SCHWARTZ said that the slide of this tumor was not very satisfactory. It had presented itself in the gross specimen as a generally enlarged ovary on one side and an oval ovarian tumor about the size of a cocoanut on the other side. The larger tumor contained a cystic cavity, the contents of which could not be ascertained, since the specimen had been in formalin for years when they took it out of the fixation fluid and made a series of sections from it. The cells were a good deal shrivelled. The sections showed an excessive hypertrophy of the stroma and between the dense strands were numerous large cells, partly single and partly in small plexus, sometimes arranged like a tubular gland. In certain parts of the tumor were found remnants of ovarian structures. The specimen did not show clearly the characteristic signet ring cells which were described first by Kruchenberg and later by Marchand. Both authors called these large secondary tumors, occurring always in both ovaries, fibrosarcoma mucocellulare carcinomatodes. This meant to say that the stroma, which was derived from the ovarian stroma, had a sarcomatous character, while the epithelial structures were carcinomatous. They were mostly secondary tumors or colloid carcinomas of the intestinal tract. The signet ring cells were probably stroma cells with mucoid degeneration of the cell protoplasm. Their case did not show the clinical signs of carcinoma elsewhere in the body, but since the patient disappeared after an uneventful recovery from the operation they were not able to decide as to whether this was a primary or a secondary tumor. The clinical diagnosis was originally ovarian fibroma. Professor Schlottlander of Vienna had looked over the sections and had helped them in establishing the diagnosis of this comparatively rare condition.

THE "MUSCLE OPERATION" FOR THE REPAIR OF PELVIC FLOOR LACERATIONS.

Dr. Austin Flint, Jr., said the fact that so many different kinds of operations were done for the repair of the pelvic floor injuries was proof that the ideal operation had not yet been devised. Almost every operator had at one time or another thought that some particular improvement had at last solved his difficulties and so had enthusiastically operated after some new method only to find that his results had, after all, not been such as would completely satisfy him. The object of his paper was to bring before his hearers his present method of operating, and to invite discussion and criticism to the end that faults, if any, might be discovered and improvements, if any, suggested. Although he had not yet been able to get a perfectly satisfactory series of photographs illustrating the various steps of the operation as he now performed it, he said he would show a few that had been taken at the hospital by Dr. Henry Clay Cowles.

In the first place it was necessary to distinguish between operations done for simple lacerations, and those done for prolapse, including rectocele and cystocele. It was also important to bear in mind that the vaginal outlet might be closed by this method more tightly than normal, and to distinguish between operations done on women who might again become pregnant and those past the menopause. For obvious reasons he was not able to show photographs of results after patients had entirely recovered. The operation he described and illustrated was the result of what he took to be the best points in the technic of the various well known operations. Some years ago he realized that the classical Emmet operation was insufficient in many instances in that the pelvic floor was insufficient. The earliest improvement was an attempt to secure the inner edges of the levator muscle by passing the needle far out on either side of the denuded area. The shape and size of this denuded area varied in different methods known by the name of those who recommended them. Up to four or five years ago the writer had been accustomed to insert a buried catgut suture in the circular fashion, grasping the muscles on either side and bringing them together in the median line. This method was first devised by Dr. Studdiford and gave really excellent results. He now believed that it was faulty in that the edges of the muscles were not dissected out, or, as expressed by Sturmdorf, mobilized. Dr. Sturmdorf had beautifully elucidated the principle of deflected pressure by levator interposition, exactly on the same principle that governed the radical cure of ordinary hernia. This principle in his operation was carried out but the technic was not the same as in the Sturmdorf operation. It might perhaps be best described as the Emmet operation, to which was added a dissection and mobilization of the levator muscles, their coaptation in the median line by buried sutures and the additional coaptation of the perineal fascia and skin by buried and external sutures. This was really a repair in layers.

The first step was to outline a triangle by placing a double tenaculum on either side of the relaxed outlet as high as it was desirable to form the new perineum. The apex of the triangle was marked by a double hook or suture placed on the posterior vaginal wall exactly as was done by Emmet. The base of the triangle was then denuded by scissors straight across from the hook on one side to the other on the opposite side. This might be done if desired with a knife. The mucous membrane was then grasped by two pairs of forceps at the lower extremities of the sulci bounding the rectocele laterally. Special forceps had been designed by his associate, Dr. William M. Ford, as it was found that the Tait forceps were apt to tear through. Having previously palpated the edges of the levator muscle a curved blunt-pointed scissors was passed, hugging the vaginal mucous membrane so that it could easily be pushed up in the form of a flap as high as the apex of the triangle and as high on the sides as the lateral points previously marked. With a double hook the muscle itself was then grasped and with the gauze-covered finger bluntly dissected anteriorly and posteriorly. At this point it was necessary to use care and gentleness, as the muscle was easily torn and sometimes was imbedded in scar tissue. It must be freed so that it could be brought to the median line without tension. The second step was to suture them together. Kangaroo tendon was best for this purpose, using three sutures in an ordinary case, and going anteriorly just far enough to bring the posterior vaginal wall in contact with the anterior. In women past the child-bearing period, especially in cases of cystocele or of procidentia, the muscles were brought together well in front, using four or five sutures if necessary. It must be remembered that it was always possible to make the canal tighter than normal. In young women who might become pregnant care must be used not to bring the muscles too far forward and thus make an opening that might obstruct labor. The sutures were tied just firmly enough to bring the muscles together without tension and the finger in the vagina tested the size of the opening.

The third step was to repair the mucous membrane. The triangular flap was now trimmed with scissors and the tongue of mucous membrane in the center was drawn down to the outlet. Each sulcus was sewn over a continuous chromic catgut suture exactly as in the Emmet operation. This left only a small external wound, which was brought together, being careful to include the fascia below the levator muscles. The first suture was of silkworm-gut and was passed as a crown suture of Emmet. The remaining sutures might be silkworm-gut or chromic gut and might or might not include the already sutured muscles.

The entire operation took about twenty minutes to perform, depending on the amount of scar tissue binding down the muscles.

In case of complete tears the essential steps were the same. The writer stated that he had had in his last four cases of complete tears first made a rectal flap or apron of mucous membrane, dissecting it from above downward as recommended by Ristine, but carrying the original incision outward on the skin to a point just outside of the depression marking the ends of the torn sphincter ani muscle. When this flap was turned down it fell into the rectum and completely protected the sutures from contamination. The retracted ends of the sphincter muscle were picked up with hooks, pulled forward, and brought together by buried sutures, usually two in number. The free borders of the levator might then be found, mobilized, and sutured as in a simple tear, or this might be done before suturing the sphincter muscle. The repair of the mucous membrane and skin was the same as before described. After all the sutures were in place the rectal flap might, in some cases, be trimmed off a little, but this should never be done until the operation was otherwise completed. It would be found that the rectal flap retracted into the rectum to a marked degree. This technic seemed to be rational and surgical in its principles, and gave ideal results both immediate and remote.

DISCUSSION.

DR. ARNOLD STURMDORF.—As an ardent promoter of direct levator myorrhaphy in perineal repair, I cannot but express my gratification and appreciation of Dr. Flint's graphic corroboration of my former contention.

I must, however, maintain that the removal of the vaginal flap is unnecessary and even undesirable inasmuch as the mucosa is merely relaxed—not superabundant—and its removal converts the normally rugous vaginal channel into an abnormally smooth-walled canal.

The correct management of the elevated vaginal flap, adapting it correctly over the subjacent denuded surfaces according to the technic elaborated in my publications, removes all appearances of superabundant tissue.

I would also object to the use of scissors in mobilizing the levator bundles, the finger more readily isolates the normal lines of cleavage between the muscle and its surroundings, thus avoiding mutilation and injury to the branches of the internal pudic artery and in certain cases to the hemorrhoidal sinuses.

These, however, are only questions of individual practice, the recognition of the levator function and its restoration to such function being, after all, the main consideration which Dr. Flint's work has emphasized in a most convincing manner.

THE VALUE OF A MORE ACCURATE DIAGNOSIS IN GYNECOLOGY.

Dr. Edward W. Pinkham said that he had been making an inquiry into the relation of the diagnosis to the result in his cases for a period of about five years. At that time he had been surprised to find how many times he had corrected an anatomical abnormality or removed a certain lesion without eliminating the symptom for which the patient sought relief. He had studied particularly some three hundred cases including practically every disease described in the text-books on gynecology, and found that he had made a goodly number of the classic, time-honored mistakes in diagnosis. He had therefore made a careful study of the facts to ascertain, if possible, the reason for his failures. The first discovery was that his histories and clinical data were not only too meager but entirely too general in character. This he thought was a common fault. It was one that could easily be corrected. A patient would apply for relief from a pain in her right side, associated with backache, leukorrhea, and constipation. With this history he would proceed to make the usual examination and institute treatment. Many times his treatment gave relief, but too many times the relief was only temporary or partial.

As a result of reflection on these things he had made it a habit, after recording the patient's own version of her symptoms, to take each symptom in order and to elaborate it to the fullest extent. The more thorough investigation often gave a clew which aided in the search, and since he had begun it his diagnoses had been more nearly exact than formerly and his operative results had proven the wisdom of his course.

He believed the most crying need of both hospital and office work was a more systematic and searching personal history together with more general clinical data. By the latter he meant that as a matter of routine all the important organs, heart, lungs, stomach, intestine, etc., should be examined as well as the urine and the blood. A test for indican was important, for if this was present in any quantity in the urine it frequently indicated the source of many abdominal pains, backache, headache, etc. It was very necessary that the blood be examined both for red and white cells and also for hemoglobin. The thyroid and the ductless glands should not be overlooked.

Another discovery that he had made was that his conception of the cause of pain, the symptom most generally complained of and for which relief was sought, was rather vague and without any very clear pathological basis. The text-books were very obscure in their teaching as to the etiology of pain and merely stated that such and such a condition was associated with pain. The writers were vague and made unsatisfactory statements that tended to mislead the student and lured him away from a personal investigation.

He ventured the opinion that generally pain was caused by an overdistention of an organ or structure, it might be by blood, serum exudate, pus, or other substance. If an ovary was subject to an acute congestion pain would be produced. The same would be true of an overdistended bowel, peritoneal interspace, uterine sinus, or nerve plexus. The chronic pain was due to a chronic infiltration or distention but was of different character. Irritation and motion increased pain as they increased the distention and militated against nature's efforts to remedy the morbid condition. Rest and quiet were the conditions demanded by nature for her beneficent work. The writer said he would not attempt to enlarge on this theory of the cause of pain, but would merely say that the theory had enabled him to understand the difference between the pain of an acute hyperemia of the ovary and that from a salpingitis, a varicosity and passive congestion of the pelvic plexuses and veins from chronic ovaritis, etc. This had convinced him that when a pain was referred to a certain locality almost invariably the offending lesion was situated at that locality or in the immediate vicinity, thus excluding to a large extent the idea of reflex pain.

The third discovery which the author made in his examination of records was that he had fallen into the habit, which he thought was more common among general practitioners than among specialists, of associating the pelvic organs with almost any symptom for which a woman sought relief. While it was true that the majority of ills to which a woman was heir had their origin in the generative organs, still the same general symptoms might be caused in many cases by lesions outside the pelvis, the pelvic organs being only indirectly involved. It was too frequently the case that the discovery of a pelvic lesion invited at once the correlation of that symptom with the lesion whether there were sound fundamental principles to rely on or not. There were many pathological conditions of the generative organs which might exist without producing symptoms especially in certain individuals. With the knowledge gained by his investigation, Dr. Pinkham said that he was positive and knew by actual inquiry that fewer of his patients had wandered into the hands of other surgeons to seek the relief which he had failed to give.

Dr. Pinkham reported three cases upon which he had operated during the past year which illustrated the principles which he had endeavored to set forth.

Case I. Mrs. T., aged thirty-eight; married six years. She complained of pain in the abdomen, both right and left, sometimes in the pit of the stomach, sometimes after eating, headache all over the head, backache, and insomnia. She was very nervous and twitched occasionally. Menses had been normal, but there had been some vaginal discharge. Her appetite was fair, and her bowels moved daily. She had lost in weight, and had chills and fever at irregular intervals. She had had one child three years before and one miscarriage five years ago which was not induced. Most of her pain which was dull and aching was on the right side about the level of the anterior superior spine of the ilium and ran down the hip. The occasional pain in the left side was a little above the navel and came after a meal. The right-sided pain began several years before marriage and had been worse since the birth of the child. Posture did not affect the pain although she could not lie long on the right side. There were no urinary symptoms and the other organs were negative. She had been under the care of a neurologist during the past year and had a plastic operation and removal of the right adnexa. There was no albumin or sugar in the urine but the indican was marked. The *x*-ray showed marked gastroptosis, exaggerated hour-glass and water-trap type. Moderate pressure over the caput colon elicited severe pain. Pelvic examination elicited no pain. The uterus was retroverted, right adnexa was not felt; the left was normal. A diagnosis was made of chronic appendicitis and gastroenteroptosis. The patient was informed of the conditions and consented to operation. Rovsing's operation for gastroenteroptosis was done and the appendix was removed. The pathologist's report showed carcinoma of the appendix. The patient made good recovery and was absolutely relieved of her pain and nervousness.

CASE II.—This patient, thirty-six years of age, had been married fourteen years and was the mother of four children, the second and third of which were instrumental, and the fourth premature. The menses were regular but she had severe pain for two days, especially deep down on the right side. She had had a curetage four years ago and an operation for abscess of the left ovary twelve years ago. She complained of pain on the right side below the crest of the ilium and some leukorrhea. She complained of chilly sensations and was very nervous and had lost weight. She was told that she had tuberculosis at both apices and went to the Loomis Sanitarium where she was told that she did not have tuberculosis. She had had goiter since her first baby was born. The pain on the right side was almost constant but was relieved when she could lie down or rested a great deal. Her backache was dull and located in the midlumbar region. She had some occipital headache and was constipated. She had also been told that she had a right floating kidney and right tuboovarian abscess. Blood examination showed 4,000,000 red blood cells, and hemoglobin 70 per cent. The urine contained no albumin or sugar. The right kidney was movable below the crest of the ilium. On the right side of the uterus was a fullness which disappeared on massage. There was no pain elicited by examination. Bissell's operation for right nephroptosis was performed and the appendix apparently normal and partially involuted was removed. The right pampiniform plexus was tied above and below, as it was much enlarged and inclined to be tortuous. Six months later this patient was seen and was pregnant. She was relieved of the deep-seated pain which she had had since she first sought medical advice. Her dysmenorrhea was much relieved.

CASE III.—This patient thirty-six years of age and married, had six children and one miscarriage. Two labors had been instrumental. She gave a history of pain in the abdomen about the navel and on each side. The bowels were constipated and she had some backache, not constant but very frequent. It was located in the upper right quadrant and just above the navel and ran to the back. At times she had some nausea, but did not remember vomiting. She had frontal headache almost daily. For the relief of this pain she had had an operation for retroversion, lacerations, and chronic appendicitis. Examination of the pelvis was negative. The colon was partially filled with feces and upon pressure gave some discomfort. Pressure over the right border of the liver and gall bladder elicited some discomfort and pain. Examination of the feces and stomach contents was negative. The urine showed trace of albumin and the indican was marked. The specific gravity was 1016. A diagnosis of gallstones was made which proved at operation to be correct. The patient was entirely relieved of pain.

A COMPARATIVE STUDY OF TWO ADVANCED CASES OF CANCER OF THE CERVIX UTERI.

DR. DOUGAL BISSELL reported these two cases of cancer of the cervix in preference to other gynecological cases which might have been selected, because of the present widespread demand when this stage of the disease was encountered, for the removal of the uterus, its adnexæ and adjacent tissues, by some of the several radical surgical procedures now in vogue. Though the history of neither case was as full as might be desired, the exact cause of death, for instance, in one not having been determined at autopsy, yet they furnished sufficient data for individual and comparative study. They were reported also with the feeling that records of concrete cases were of value in furnishing not only the most satisfactory basis for generalization, but were helpful in determining the question of operability or inoperability in a given case.

CASE I.—She was forty-six years old, menopause at thirty-six. For the past five months she had a bloody discharge and considerable pain in the back. Micturition was frequent. She had a slight cachexia. Examination on December 5, 1910, showed a vaginal discharge, bloody, offensive, and somewhat irritating. There was an extensive erosion of the cervix and vaginal mucous membrane. There was a thickening of the parametric tissues with consequent fixation of the cervix. Her farther died of cancer of the throat. The diagnosis of cancer of the cervix was made and operation performed on December 7, 1910. The diseased area of the cervix was thoroughly scraped with a sharp curet and the actual cautery extensively applied. The large cavity remaining was packed with a cotton tampon saturated with a solution of zinc chloride and water, 2 to 1, which was held in position by a vaginal packing soaked in vaseline to protect the lower area of the vagina. On the tenth day a large mass of tissue was expelled per vaginam. This was two or more inches in length and an inch or more in thickness. The patient had a comfortable convalescence, and for eight months or more continued in good health. The vaginal discharge practically ceased. An examination eight months after showed a vagina 1 1/2 inches only in depth, with hard and thickened walls. On or about November 7, 1911, she began to fail rapidly. She had extreme constipation, passing of mucus per rectum, chills and fever, anorexia and vomiting, tenderness over the stomach, and there were noted enlargements in the liver and kidney regions. The vomiting became so distressing that it was decided to give temporary relief by gastroenterostomy, though it was appreciated that death was inevitably near. This was done, but she survived operation only a few days. At the postmortem both kidneys were found with pelves distended, cortex thick and with the right one studded with small abscess cavities. The bladder wall was very much thickened. A section of the cervix showed thick, purulent fluid. The anatomical diagnosis was pyonephrosis, hydronephrosis, carcinoma of the cervix uteri, and metastases in the diaphragm. The microscopical diagnosis was carcinoma of the cervix uteri with metastases in the left ureter, diaphragm and mesenteric nodes. There was an atrophic left kidney and compensatory hypertrophy of the right kidney, with multiple abscesses and fatty degeneration of the liver.

CASE II.—This patient was forty-seven years old and married twenty-nine years. She had one child twenty-eight years old. Menstruation was normal until three months ago. For the past three months she had slight but constant bloody discharge, not offensive. She had pain in the lower abdominal region and back, radiating down the hips. She had loss of weight and marked anemia. There was a trace of albumin in the urine, but no casts. Digital examination showed a large cervix with growth from the right side extending into parametric tissue. The fundus was movable. On January 25, 1912, a circular incision was made about the vaginal portion of the cervix and at considerable distance from it. The vaginal mucous membrane was dissected from its adjacent tissue and an inch or more removed. The growth on the right side of the cervix proved to be so extensive that he was forced to open the abdomen in order to intelligently complete the operation. The bladder was found firmly adherent to the anterior surface of the cervix, and a larger portion of it had to be removed. The growth from the right side of the cervix completely surrounded the lower portion of the right ureter and it was found necessary in removing the growth to sever the ureter two inches from its insertion into the bladder. The opening into the bladder was closed with interrupted chromic catgut sutures and the cut end of the right ureter was anchored in the right angle of the bladder wound. A gauze drain was passed from Douglas's culdesac into the vagina. The patient made a good recovery save that the bladder wound opened completely on removing the gauze. A careful examination of the fistula showed a complete loss of that portion of the bladder wall extending from about the normal left ureter to the artificial insertion of the right ureter, which was high up on the right pelvic wall; the bladder and vagina were therefore a continuous tract and the mouth of each ureter could be distinctly seen in each lateral angle. As the edges of the fistula appeared healthy, repair was attempted seven weeks after operation. Three weeks later the patient complained of pain in the left kidney region. The urine showed a colon bacillus infection, which was treated by acid sodium phosphate and urotropin. The specimen removed at the first operation was given to Dr. Wm. N. Berkeley, who made from it sufficient serum for six injections. Dr. Berkeley's report on the specimen was "squamous cell carcinoma of the cervix. The growth is very extensive and quite typical." He further stated that "the gross specimen is one of the largest cervical cancers I have ever seen successfully removed." The patient was discharged from the hospital June 6, 1912. While her general condition was slightly improved, she was practically as much of an invalid as when she entered. She died August 5, 1912.

The first case was one typical of a class possessing unquestionable evidence of a well advanced malignant lesion, yet a class to which a radical operation was not infrequently applied. In the light of knowledge gained from a personal experience it seemed to him beyond surgical cure. So with the idea only of checking the rapidity of the growth, and ameliorating some of the local symptoms, the cautery and caustic were applied. Out of the eleven months she lived, eight of them were spent in comparative comfort. Dr. Bissell was of the opinion that a radical operation would only have exposed the patient to greater risk of immediate death, and would have offered no hope of ultimate recovery.

The radical operation by the combined route was selected in the second case because the area of invasion was in the middle and upper portions of the cervix, and so extensively involved the structures to the right that to have removed it per vaginam by any of the known methods would have been impossible without inflicting an immediately irreparable injury to the ureter. A more radical operation could hardly have been performed than that of this case. Retrospectively it seemed to him that the surgical result in this unpromising case was better than he had reason to hope, particularly after determining by exploration the exact extent of involvement; yet the disease was not checked. Areas at great distance from the primary lesion must have already been affected at the time of operation. In fact the surgical effort only jeopardized the patient's life and offered grave chances of added complications equally, if not more distressing, than were the original symptoms.

In the early stage of cancer of the uterus, all surgeons were in accord respecting the advisability of some one of the several radical operative procedures now in vogue, but the combined experience of the surgical world had not yet determined a line of demarcation between operable and inoperable cases, and until such was determined each surgeon had only his individual experience to guide him. In Dr. Bissell's judgment when malignancy had practically destroyed the cervix, and had involved the vaginal mucosa, or adjacent tissues, metastases, with few exceptions, had already begun to develop, and the distance was beyond the reach of the knife. The hope of the future, with regard to the surgical cure of cancer, was in the recognition of the disease in its early stage. The layman must be educated to understand the necessity for frequent examination and to appreciate the fact that no growth should be considered innocent until it was so proven.

TRANSACTIONS OF THE MEDICAL SOCIETY OF THE COUNTY OF NEW YORK.

Meeting of April 21, 1913. (*Continued.*)

The President, BROOKS H. WELLS, M. D., *in the Chair.*

DR. LOUIS J. LADINSKI read a paper on

THE ELASTIC AREA IN THE ISTHMUS OF THE UTERUS, A POSITIVE EARLY SIGN OF PREGNANCY.*

DISCUSSION.

DR. ELLICE MCDONALD.—The diagnosis of early pregnancy must, after all, depend upon vaginal examination. The conditions caused by pregnancy, of growth and increased vascularity of the uterus must first have their effect upon the uterus itself and the pelvic organs. The changes may first be expected in the uterus itself, then in the vagina and the adjacent parts. The signs of pregnancy may be divided into 1. the congestive signs, *i.e.*, blush and flush of the vaginal mucous membrane, blush of the cervix and softening of the cervix, and 2. uterine signs, including enlargement of uterus, softening of the uterus, intermittent uterine contractions, Hegar's signs and my own sign.

Great care was taken in the examination of these women in order that any tendency to error might be avoided. The diagnosis in the early weeks in one which must depend upon exactitude and skill in vaginal examination. It is of the greatest importance that the bladder should be emptied. If any urine remains within the bladder, it is impossible to appreciate any minor changes in the size, shape and consistency of the uterus. The fundus cannot be accurately outlined and the intermittent contractions of the uterus cannot be felt.

The waist bands should be loosened and the patient in good position with the hips well elevated upon an examining table or a hard bed. If necessary, a board should be put under the bed. The examiner should be in an easy position and one in which he may be able to hold his examining hands perfectly still over a period of minutes in order to properly appreciate the intermittent uterine contractions. The length of vaginal examination should extend over sufficient time to recognize two contractions of the uterus with the intervening relaxation. This is usually from five to ten minutes. If the patient is upon an examining table, one should rest one's foot upon a stool or step, and the arm upon the thigh in order to have proper control of one's hand. If the patient is upon a bed, the elbow may be rested upon the mattress. In this way, it is possible to take all muscular strain off the examining hand and more delicately appreciate any of the more minute pelvic changes. The greatest possibility of error is in making too hurried an examination and in finding the uterus in one phase of contraction or relaxation.

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*For original article see page 210.

The diagnosis of early pregnancy must depend upon no one sign, but upon the conjoined evidence of all signs. The congestive signs of flush of the vagina, etc., offer reliable evidence after the third month, but are of no great use before the ninth week.

The diagnosis of early pregnancy must depend upon the changes in the uterus from the growing ovum—irregular enlargement, symmetrical or otherwise, intermittent contractions, Hegar's sign and McDonald's sign.

These last two signs of compressibility and flexibility of the isthmus with enlargement and irregular contraction allow of a positive diagnosis being made within ten days after the missed menstruation and increase the ease of positive diagnosis at a later period.

DR. SAMUEL WYLLIS BANDLER read a paper on

THE DUCTLESS GLANDS IN RELATION TO GYNECOLOGICAL CONDITIONS.

Dr. Bandler said that the internal secretions bear the most intimate relation to the various functions of the body from childhood up. The secretions and proper functions of the thyroid and hypophysis preside over the development of body and mind and bear an important relation to stature. These glands likewise control, to a great degree, development and function of the ovaries. The genital glands may be involved by these alterations or by infectious diseases or may show lack of proper energy because of a general congenital asthenia. Early genital maturity is associated with early ossification of the epiphyses and results in short stature and short legs, whereas late genital maturity gives an increased height with an unusual length of limb. On the other hand, tumors of the adrenals and of the pineal gland might be responsible for hypergenitalism. The rapid growth at puberty is greatly under the control of the hypophysis, and overfunction within normal limits on the part of the hypophysis would produce a normal giant, sexually intact. Failure of hypophysis action in the earlier years result in the production of dwarfs and in later years, after adolescence, hyperfunction of the hypophyiss would produce giants, but in either case there would be failure of ovarian and genital development. Oversecretion of the hypophysis after full growth had been attained produced acromegaly, whereas underfunction of the posterior lobe in adult women resulted in a typical form of obesity characterized by a general distribution of fat, lessened carbo-hydrate metabolism and regressive changes in the genitalia with relative or absolute amenorrhea. Dr. Bandler had formerly considered these cases to be due to diminished function on the part of the ovaries and thyroid, but now underfunction of the hypophysis must also be considered. At puberty the thyroid and ovary began to exert their reciprocal relations. Young girls at that time were not infrequently subject to tachycardia, associated with each menstruation, or more or less persistent, for which alteration, in many instances, the thyroid was held responsible. In fact the manner in which the growing girl reacts to the menstrual onset, with or without thyroid complications, is a fair index of thyroid stability at that period. Some of the excessive bleedings during these years are due to excessive action on the part of the ovarian secretion. Menstruation is due to the congestion produced by the ovarian secretion and the amount of blood lost and the duration of the menstruation is limited by the contractile forces inherent in the muscle fibers and elastic tissues in the uterus. An endometrium overgrown as a result of excessive ovarian stimulation would readily bleed in the years during puberty and adolescence. In the later years of a woman's life, when the uterus after successive labors have lost its elasticity, and the elastic fibers are replaced to a great degree by fibrous connective tissue, healthy overfunctionating ovaries, which fail to regress, would produce an excessive uterine congestion which the uterus could not control or limit. Hence the frequent preclimacteric hemorrhages occurring in uteri to which the author had given the name fibrosis uteri. Pregnancy depended on a ripe ovum, on union with an active spermatozoon, and on active cilia, which carry the impregnated ovum into the uterus. Dr. Bandler thought that many cases of sterility were due to the fact that the ovary failed to give off ripe ova, and in many instances the Graafian follicles failed to possess the secretory activity essential to bursting; hence the ova were not thrown out at all. In many instances he thought that failure on the part of some internal secretion, either ovarian or thyroid secretion or hypophysis secretion, to properly activate the cilia of the tubes was productive of cilia which had no propulsive power, and thus, sterility resulted. Various of the internal secretions play an important part in producing nervous annoyances in women. Failure of ovarian secretion at the climacteric age produces some of the symptoms belonging to the so-called "change of life." Alterations in the secretions of the hypophysis produce changes in a woman's nervous and mental state of a nature previously not recognized. The most important relation in this channel concerns the thyroid secretion. Myxedema and Basedow's disease are eight to ten times as frequent in women as in men. Thousands of women suffer from hypothyroidism and hyperthyroidism of degrees far more slight than either myxedema or Basedow's disease and the diagnosis is not made. The annoyances concern the digestive tract, the menstrual function, and the nervous system. And most of these cases are diagnosed as neurasthenia or hysteria. Gynecologists were at fault in attributing many of these annoyances to reflexes produced by pelvic anomalies. This was wrong. A great injustice has been and is done to thousands of women and a tremendous number of unnecessary operations are performed to cure women of nervous and digestive symptoms when these are really due to glandular alterations especially such as involve the thyroid. In the climacterium these nervous cases were numerous. Many were cases of hypothyroidism, and a large number were due to hyperthyroidism. Here the relation between the ovaries and the thyroid became manifest. If ovary and thyroid regress with equal ratio, the patient went through the menopause with very few annoyances. If the thyroid regressed quickly, more quickly than the ovary the patient was in a state of relative hypothyroidism. If the ovaries regressed quickly and the thyroid slowly, the patient was in a state of relative hyperthyroidism. In a woman's life many factors tended to make her nervous. Her home life, the degree of happiness, many factors associated with marital relations, must be taken into consideration: but above all these the relations of the various glands to the patient and the relation of the various glands to each other deserve a most earnest consideration.

Dr. William S. Stone said that, without the anatomical proof of the existence of what Dr. Ladinski has defined in the title of his paper as "the elasticana," he did not consider the mere statement of the tactile sense of elasticity being the feature by which he had recognized it, was sufficient to establish it as an early and positive sign of pregnancy.

He also said that he did not think his other conclusions that it is a sign, capable of easy recognition and applications, that it is new, etc., were supported by Dr. Ladinski's description of his own clinical experience . Dr. Stone stated that he thought Dr. Ladinski's definitions and conclusions illustrated a common mistake of presenting as a discovery a description of individual sense perception, or simply a new and different verbal expression of similar sense perceptions. For example, he did not believe Dr. Ladinski had become cognizant of some previously unrecognized and in the uterus which, because of structural changes, appeared to be elastic. This area has appeared to others, either presenting different qualities, or they have expressed these qualities in a different way.

A factor which he thought Dr. Ladinski has overlooked is that the appreciation of changes in consistence of tissues is especially difficult, and it is still more difficult to verbally express our appreciation of such changes.

In his own experience, Dr. Stone said, the understanding of the changes indicated by the so-called Hegar's sign has been most difficult.

His first appreciation of the changes in this zone of the uterus was with the feeling that the body of the uterus was attached to crevix by a short pedicle. From Bumm's text book, he stated that be obtained his first clear interpretation of these changes to which Dr. Ladinski has directed our attention.

The increased vascularity, as Bumm states, begins, of course, immediately after conception occurs, and the difference in the consistence as a result of the vascular changes will be uniformly appreciated throughout the entire organ. Implantation, however, almost always occurs in the fundal area upon one or the other side of the median line, and until the end of the third month, because of the disproportionate increase in the size of the uterus the gestation products do not completely fill the cavity, and so that with the altered consistence from the vascular changes the lower zone feels disproportionately thin.

Dr. Stone called attention to the error of the drawings that had been projected upon the screen. They failed to show the asymmetry of the uterus which almost invariably existed at the beginning of pregnancy because of the fact that implantation rarely occurred in the median line.

It also corroborated Dr. MacDonald's statement; one could not depend upon any single sign for the diagnosis of pregnancy.

THE PHYSIOLOGICAL TREATMENT OF FLAT-FOOT.

DR. JACOB TESCHNER read this paper. Not entering into a discussion of the preparatory treatment of the graver and more advances cases of flat-foot, he confined himself to that class of cases which gave discomfort and pain, with or without deformity, and which comprised by far the great majority of cases. The tremendous importance of this subject could hardly be estimated. Often, when man, woman or child complained of pain or a tired feeling in the feet or legs, the lay or professional diagnosis of flat-foot or "sunken arch" was made, and the treatment by various devices in shoes and arch supports were instituted which invariably tended to aggravate existing conditions and actually produced a flat-foot if it had not already existed. There was no denying the fact that patients did get relief for a time from almost any device which altered the position of the weight-bearing foot, but therein lay the danger of the production of actual structural changes. The treatment was pernicious, whether given by the specialist, the general practitioner, the shoemaker, or the shoe vender. The specialist carefully made a cast of the foot and had a brace or arch support, and a shoe constructed upon it. No cast was ever made with the foot in proper position and bearing the weight of the body, and as the foot assumed an entirely different shape in action, a cast of a passive foot could be of no value. The general practitioner simply sent the patient to a shoemaker who worked for a specialist, or to a shoe vender who advertised more or less extensively. They either used braces, or built up the shoes with stiff counters, or both, and actually rendered any improvement impossible. Every brace and every stiffening of the shoe *prevented proper ankle motion and* *forced the foot into a position of eversion, and thus prohibited the use of the ankle-joint in walking.* No shoe that could be constructed was curative. The shoe that should be ordered was one that would permit absolute freedom of ankle and toe action, and should fit closely to the arch and heel. The width of the sole should be sufficient to permit the entire weight-bearing foot to rest upon the sole. The broad part of the inner side of the sole must be extended sufficiently backward to permit the entire ball of the foot to rest upon it and the arch of the foot must be short. Any support which might give temporary relief was vicious because it caused the weight to be borne upon the inner arch, which was unphysiological. The anatomical and physiological studies of the foot had positively demonstrated that the inner arch was never intended to bear weight; hence, the use of an arch support was unphysiological and fallacious.

Flat-foot was due to a faulty gait occasioned by many varied causes, all of which tended to a faulty muscular action. Handled children of the wealthier classes were more prone to this condition than the neglected and often shoeless children of the tenement. When the school age arrived they received the pernicious instruction to "toe out" in "attention." The same thing was invariably taught in dancing schools. Later in life occupation played an important part in the causation of flat-foot. Those who were upon their feet the greater part of the day, and whose activities were limited to a few steps at a time, those standing as nurses, men on the floors of exchanges, barbers, waiters, shopkeepers, etc., were especially prone to acquire this condition, the main cause being that when they stand, they do so with the feet everted, and the thighs and legs were used as pegs, permitting the arches to sink.

After sprains of the ankle the timidity due to the pain caused by the proper use of the ankle-joint caused eversion and consequent flat-foot. The affected swagger of young swains, to acquire a distinguished aristocratic gait in their promenades, rarely failed to produce flat or weak feet. This was especially noticeable among Austrian army officers who appeared to consider it a distinction to have flat-feet, round shoulders and hollow chests. The lack of tonicity and proper and concerted action of the muscles of the hip, thigh, leg and foot were the real causative factors, not excluding the pose of the trunk. The education and strengthening of the muscles would bring about a proper gait, and a cure would be effected. The patient with a flat-foot or flat-feet had a swaying gait because the weight of the body was alternately swung from one leg used as a peg to the other used in the same manner. The power of balance upon one foot was partially or totally destroyed from improper use. This could be readily taught and restored. When the full weight of the body was carried upon the balancing foot, the arch was considerably and visibly raised by muscular action. The elements of the proper gait were taught in conjunction with the acquired balance, to eliminate the swaying of the body and to give a propulsive impulse to the step. The outward rotation of the thigh, and the pointing of the knee outward and upward, must be overcome in order to insure the placing of the toes forward at each step. These exercises and their effect could be readily demonstrated, but it was hardly possible to give an intelligible description because the closest attention must be given to the most minute details of the various movements. The exercises must be demonstrated to be understood. The results of this treatment were inevitably positive and very rapid, so much so that the majority of the distressed ones were relieved within one week, the arch was perceptibly raised within a month, and the formerly prominent maleolus was no longer in evidence. This had been his universal experience for almost twenty years; during this time he had never used a support of any kind. The faults in each case must be carefully studied in order to rapidly and thoroughly correct the existing faulty gait and deformity, or both, and the disability caused thereby. The exercises were few in number, and could readily be executed by the patient in ten minutes and should be persisted in night and morning. They should be done in bare or stockinged feet so that every part of the foot, including the toes, could have free play. Nothing could be more patent than the very rapid improvement and relief which was obtained by this method of treatment, and all that was desired was usually accomplished in from three to five visits. An intelligent and unbiased consideration of the subject could not fail to shatter the traditions of the hitherto accepted and almost universal unphysiological treatment of flat-foot.

ITEM.

CLINICS, DEPARTMENT OF PUBLIC CHARITIES.

New York City.

Obstetrics and Diseases of Women and Children.

Calendar for September, 1913.

City Hospital.—Obstetrics, Dr. Shears, Wednesdays, 2:00 P. M.

Cumberland Street Hospital (Brooklyn).—Gynecology, Dr. Pierson, Wednesdays, 2:30 P. M.

Coney Island Hospital.—Pediatrics, Drs. Beck and McQuillan, Wednesdays, 3:30 P. M.

Coney Island Hospital.—Pediatrics, Drs. Pendleton and Van Wart, Wednesdays, 3:30 P. M.

City Hospital.—Gynecology, Dr. Child, Thursdays, 2:00 P. M.

Coney Island Hospital.—Gynecology, Drs. McEvitt and Mills, Thursdays, 10:30 A. M.

Kings County Hospital (Brooklyn).—Gynecology, Dr. McNamara, Saturdays, 1:30 P. M.

All registered physicians, visiting and resident, and medical students, are cordially invited to attend these Clinics. Cards of admission, valid until October 1, 1913, may be obtained at the Academy of Medicine, 17 West 43d Street, Manhattan, and at the Medical Society of the County of Kings, 1313 Bedford Avenue, Brooklyn, as well as from the Secretaries of the several Medical Colleges.

REVIEWS.

INSURANCE MEDICINE. Suggestions to Medical Examiners. By HENRY SCHROEDER, M. D., Medical Director, Mutual Life Insurance Company of New York; Editor Insurance Department, Medical Record. 150 pages. New York: William Wood & Company, 1913. $2.00.

This small book should be read by every physician doing insurance work as it will save them from making errors which to them seem unimportant but are in reality of great importance to the Companies. The physicians not interested in insurance work should read this work because they know, as a rule, very little about the prognosis of the various lesions of the body. The sections on family history, over- and underweight and that on blood pressure and their relation to longevity are most interesting. The book is well written, brief and full of valuable information.

J. G. W.

DISEASES OF THE STOMACH. Including Dietetic and Medicinal Treatment. By GEORGE ROE LOCKWOOD, M. D., Professor of Clinical Medicine in the Columbia University; Attending Physician to Bellevue Hospital, New York. Octavo of 624 pages. Illustrated with 126 engravings and 15 plates. Lea & Febiger: Philadelphia and New York: 1913.

This volume is of marked interest to the internest on account of the strong personal element and the interpretation and classification of symptoms by the writer after years of experience. The chapters on Acute and Chronic Ulcers and allied conditions as well as those on malignant growths are most complete and will be found of great value in helping the physician to come to an understanding about these difficult subjects. It is interesting to notice that the subject of neurosis is confined to a comparitively few pages near the end of the book, and shows clearly the effort made by the writer to make a definite diagnosis in all his cases rather than rely upon some term which may satisfy the patient but leaves the true diagnosis unmade.

Throughout the work the cuts are mostly original and inserted wherever they will help to elucidate the text. The charts describing pain and its relation to food are most instructive. The treatment of the different disorders is given in detail and where the author has failed to obtain results he does not hesitate to say so. The last Chapter, that on Various Diseases and their Gastric Relations should be read frequently, especially by those who largely limit their practice to Gastroenterology.

This volume will be found of the greatest value to the general physician on account of its clearness, conciseness and the elimination of theories.

J. G. W.

Gonorrhea in Women. Its Pathology, Symptomatology, Diagnosis and Treatment: Together with a Review of the Rare Varieties of the Disease which occur in Men, Women, and Children. By Charles C. Norris, M. D., Instructor in Gynecology at the University of Pennyslvania; Assistant Gynecologist to the Hospital of the University of Pennsylvania; Physician to the Maternity Hospital, Philadelphia. With an Introduction by John G. Clark, M. D., Professor of Gynecology, University of Pennyslvania; Gynecologist in Chief to the Hospital of the University of Pennsylvania. Octavo of 521 pages, illustrated. Philadelphia and London: W. B. Saunders Company: 1913. Cloth $6.00 net, half morrocco $7.50.

Dr. Norris is to be congratulated on the very admirable book he has produced, in which he sets before the profession in a most complete way the present knowledge of gonorrhea in woman—a disease of such importance that it stands in the first rank as a cause of sorrow and distress.

The book opens with an interesting and curious chapter on the history of the disease up to the time of the positive establishment of the pathogenic character of the gonococcus of Neisser. The bacteriology, cultural and staining methods of the gonococcus are elaborately discussed; then follow the pathologic changes produced in the female genital tract, the pathogenesis, the sociological problems, prostitution, prophylaxis, the examination of patients, gonorrhea of the external genitals, gonorrheal vaginitis or cervicitis, gonorrheal endometritis, gonorrheal metritis, intramural uterine abscess, gonorrhea of the Fallopian tubes and ovaries, the treatment of pelvic inflammatory disease, unusual manifestations and remote complications, gonorrhea in pregnancy, labor and the puerperium, gonorrhea in the extremes of life, complications and nongenital gonorrhea, gonorrheal septicemia, bacteremia and toxemia, gonorrhea of the osseus and circulatory systems, gonorrheal skin lesions, gonorrhea of the lungs, pleura, kidney, and nervous system, wound and glandular infection, and gonorrheal therapy.

In the Chapter on Sociology statistics have been carefully compiled to show the serious effects of the disease upon the individual and upon the general civic body. The various methods for the limitation and suppression of the social evil have been reviewed and the situation as it exists in the United States very thoroughly dealt with, with the conclusion that legal restraint is of little actual value in the lessening of this evil. Under Prophylaxis special stress is laid upon the necessity for educating patients as to the communicability of the disease and the necessity for protecting innocent individuals. The necessity for an obligatory certificate of good health for the male before marriage is insisted upon. The policy of rigid secrecy that now prevails relative to venereal diseases is condemned and stress is laid upon the advantage to be gained by making these diseases notifiable. The necessity of ascertaining when a cure has been effected is emphasized, the author regarding as criminal laxity the neglect of physicians to determine that an actual cure has been effected before allowing marriage. The very remarkable results of the prophylactic measures employed in the Navy are given in detail and are most instructive. For instance, on the Charleston, in Philippine waters, 437 exposures failed to report for the prophylactic treatment and of these thirty-two developed venereal disease, while 1396 admitted exposures were treated, of which only one developed a disease.

The chapters on treatment are conservative and thorough. The relative value and the present status of the serum and vaccine treatments are considered in detail.

The book is a valuable addition to medical literature and one must agree without reserve with Dr. Clark when he says in his introduction "The careful student will find, after a close perusal of the work, that the author has written a highly instructive treatise, in which he has most satisfactorily encompassed the many aspects of this complicated question. He has reviewed in detail the several divergent sociologic views concerning this collossal evil, and as a commentary, offers judicious suggestions that will be of value to those endeavoring to find the best solution for these problems. Because of the broad and comprehensive character of the book, it will be of great value to the physician, the surgeon, the specialist, the legislator, and the sociologist."

A Reference Hand-book of Gynecology for Nurses. By Catherine McFarlane, M. D., Gynecologist to the Woman's Hospital of Philadelphia. Second edition, revised. 32 mo of 156 pages with original line drawings. Philadelphia and London: W. B. Saunders Company, 1913. Flexible leather, $1.25 net.

As in the first edition the author keeps well within the boundary of knowledge useful to nurses, the greatest attention being paid to those duties which are of the greatest help to the physician. Much space is devoted to preparation for operation, pre- and postoperative treatment, and the aid to be rendered at the time of operation or examination. The principal changes in this edition relate to changes in technic, as the dry sterilization of gloves and the iodine preparation of the skin, the after-care of the major gynecological operations, and so on. The book is recommended.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

The Application of Abderhalden's Ferment Reaction in Pregnancy and with Carcinoma.—Markus (*Berl. klin. Wchnschr.* April 28, 1913) has studied this reaction with particular reference to the behavior of the serum of patients afflicted with carcinoma in the presence of placental and carcinomatous tissues. With the method as first developed by Abderhalden fifteen pregnant and puerperal cases were examined, all with positive results. In one of these the test was applied within eight days after the ommission of a period and in another eighteen days postpartum. In one case in which the examination was made four weeks after labor, the reaction was negative. In three cases of extrauterine pregnancy a positive result was obtained. As a control for this series of cases eighteen nonpregnant women were examined, some of which were entirely free from disease and others presented ovarian tumors and gonorrheal diseases of the adnexae. In none of these was a positive reaction obtained. In five cases of carcinoma in which the serum was brought in contact with placental extracts, a positive result was likewise obtained. The author then employed the methods which were later perfected by Abderhalden and confirmed the latter's findings in twenty cases of pregnancy. Ten specimens of serum from carcinomatous patients were likewise tested and in seven an absolute negative reaction was obtained. Markus believes that the test cannot be regarded as absolutly specific although individual differences in the composition of various placentæ may affect the result and in the presence of tumors a positive pregnancy reaction must be regarded with doubt.

Study of the Uterine Nerves. — Hoogkamer (*Arch. f. Gynk.*, Bd. xcix, Heft. 2) has made a careful anatomical study of this subject for the purpose of determining the distribution of the nerves in the uterus and to determine whether ganglion cells are actually present in this organ. The material included uteri from various animals and also human subjects. These observations demonstrate that the uterus is particularly well supplied with nerves wich undergo extremely fine division and also with multipolar ganglion cells not only in the muscular coat, where they are disposed particulary around the vessels, but also in the mucosa. There are communications present between the smallest nerve fibrils and the ganglion cells referred to and in the course of the same numerous bipolar cells were also found. The smooth muscle cells, the blood-vessels and the epithelium are directly connected with the nerve elements mentioned. In the course of the larger nerve groups of ganglion cells are found in the subserous layer and also in the superficial part of the muscularis.

Arterial Tension during the Appearance of the Milk.—Audebert and Etchevers (*Bull. de la Soc. d'obst. et de gyn.*, March 3, 1913) finds a lowering of arterial tension at the end of pregnancy in the normal subject, which passes over after 6–8 days. He examined the arterial tension in 25 patients after labor and found this to be the case, there being a lowering of 11 millimeters of mercury. It increases a little just before milk begins to be secreted to reach the acme of the rise at the moment of the mammary congestion, on the third or fourth day. When secretion is established the pressure is lowered again to the point at which it was before milk was secreted. Therefore the curve of arterial tension seems to be influenced by the secretion of milk. Normally this influence is shown by hypertension, since the tension reascends at the moment of milk secretion.

Hysterographic Method of Registering Uterine Action.—Fabre (*Bull. de la Soc. d'obst et de gyn.*, March, 1913) has succeeded in obtaining traces of the action of the uterus during labor registered on cylinders. His method is to introduce into the vagina inelastic rubber balloons, which when filled with fluid register the uterine contractions made in the cervix uteri. He also took traces of the movements of the abdominal wall. The internal traces show a gently undulating line due to respiration. Coughing and deep inspiration are shown by sudden rises in the line; the movements of the child are difficult to distinguish. In the external trace are shown variations of extrauterine origin. The movements of the child are shown; large movements of the patient make little change in the curve; respiratory movments are slightly shown. The external method is easy to employ, but of little service; it exposes the patient to no risk of infection. The internal method can be applied only when dilatation by means of a balloon is necessary.

Use of Fetal Serum to Cause the Onset of Labor.—A. J. Rongy (*N. Y. State Jour. Med.*, 1913, xiii, 119) reviews the experiments of von der Heide in the injection of the serum of parturient women and of fetal serum during pregnancy. In four cases after injection of serum labor pains set in which led to expulsion. In three cases one injection sufficed. In two cases a slightly larger second injection was given after the first injection. In three cases pains appeared transiently. The author's own experiments were made on 19 cases. In six patients, experiments, one or more injections induced labor pains which led to the expulsion of the child. These patients were at least from 10 to 18 days before term. The writer noticed that when the initial dose is large it is not effectual, so commenced with small doses anywhere between 5 and 7 c.c., followed by a larger dose of 20 to 25 c.c. four or five hours later. Both patients received small doses for the first injection and large doses for the second, and both suffered from severe reactions. In inertia the serum was found to be effectual. Seven of the writer's experiments proved negative. The most frequent symptoms after the first injection were chills lasting from 2 to 30 minutes, nausea and vomiting. Precordial pain or oppression was present in four cases. In order to firmly establish that these labor substances are present either in the maternal or fetal circulations and that they act specifically on the muscular structure of the uterus, causing it to contract, experiments with other protein substances will have to be conducted to ascertain whether they may not act in the same manner when introduced in the circulation of the pregnant woman. In all probability the whole act of labor and the toxemias of pregnancy will in the future be regarded as anaphylactic reactions. The toxemias of pregnancy and especially eclampsia should be viewed from the standpoint of a maternal circulation overcharged with foreign protein substances.

Abdominal Cesarean Section in Eclampsia.—J. T. Williams (*Bost. Med. and Surg. Jour.*, 1913, clxviii, 456) has collected from the literature 85 cases of abdominal Cesarean section for well developed eclampsia, excluding operations postmortem and on the dying. Those give a maternal mortality of 48.2 per cent. Contrasted with this are the figures of a few leading operators which show that vaginal Casarean section has a mortality ranging from 3 per cent. to 18 per cent; and dilatation of the cervix from 7 per cent. to 26 per cent. Therefore, abdominal Cesarean section in eclampsia should be restricted to those cases in which there is a pelvic contraction sufficient in itself to demand it, and possibly also early cases of threatened eclampsia at or near term, where the shock of a vaginal delivery seems to offer much greater danger than the added strain imposed upon the excretory organs by Cesarean section.

Ovarian Pregnancy.—G. Chiene (*Edin. Med. Jour.*, 1913, n. s., x, 316) records a case of ruptured very early primary ovarian pregnancy. No fetus was discovered, but in a great number of the sections chorionic villi were present in the blood clot, which protruded from a rupture in the uterine end of the right ovary. The possibility of conception had occurred on two occasions, therefore the pregnancy was of either ten or twenty-two days' duration.

The Relations between Hyperemesis and Acute Yellow Atrophy.—Heinrichsdorff (*Arch. f. Gynäk.*, Bd. xcix., Hft. 3) as the result of his studies in Ponfick's Institute in Breslau believes that hyperemesis is a typical disease of the first half of pregnancy which may extend over a period of weeks and months and lead to great loss in weight without it being possible to determine any organic lesion as a basis for the same. In rare cases death may ensue and the autopsy show nothing positive. Intoxications result in pregnancy which are commonly known as eclampsia or acute yellow atrophy of the liver. In these the autopsy shows the parenchymatous degeneration of the liver or more rarely an acute hemorrhagic nephritis or evidences of a toxic icterus. Such intoxications may develop during good health or follow upon a hyperemesis. The author believes that the autopsy findings in fatal cases of hyperemesis cannot be regarded as an anatomic expression of this disease because there is no relation between the long duration of the vomiting period and the recent character of the organic lesions. Moreover, similar findings are observed in pregnancy intoxications that run an acute course but are not marked by hyperemesis. In other words it would appear as if hyperemesis is not derived from an intoxication but on the contrary becomes transformed into such and in this way the fatal issue may be explained in the majority of cases.

Care of the Umbilical Stump.—Nadory (*Zentralbl. f. Gynäk.*, 1913, No. 21) presents a method for treating the cord antiseptically which he used in a series of fifty cases and found that the stump was thrown off within two or three days. The method is as follows: After the pulsations cease the proximal segment of the cord is swabbed with a 1 per cent. sublimate solution and at the place where the cord passes off into the skin of the abdomen a strong sterile silk ligature is tightly applied and the cord cut immediately above the same. A second ligature must be applied a few inches distal to the first before cutting the cord. The resulting stump is immediately painted with tincture of iodine. After the baby is bathed more iodine tincture is applied, then a sterile dressing. He recommends that the baby be bathed daily and tincture of iodine applied to the stump after each bath until the same drops off. The writer claims that by this method the danger of infection is entirely avoided. The very small stump cauterized with tincture of iodine dries rapidly and falls off, no subsequent hemorrhage is likely to occur, nor is any after treatment necessary.

Influence of the Physical and Social Conditions of the Mother on the size of the Offspring.—Gutfeld (*Ztschr. f. Geburtsh. u. Gynäk.*, Bd. lxxiii, Hft. 1) has studied the material in Franz's Clinic including 5000 consecutive cases, from which he concludes that in mothers of approximately the same age male children are larger and heavier and present greater cephalic measurements than the females. Very young mothers are liable to give birth to completely developed children with normal average measurements. The length and weight of the fetuses show a steady increase with the age of the mother and reach their maximum during the period between the twenty-eighth and thirty-fifth year. Male children born in wedlock have a greater size and weight than illegitimate offspring but in female children this relationship is reversed. The children of servants were found to be larger and heavier than those of working women, because among the mothers illegitimately pregnant, house servants are usually more favorably provided for than the others. The length, weight, and cephalic measurements of children were found to be proportionate to the height of the mother. Similar relations were also found in stillborn children. In multiple pregnancies the offspring were in general less in size and weight than in single births, although in many cases twins showed normal size and measurements.

Trendelenburg's Operation in Puerperal Pulmonary Embolism.—Vogt (*Zeitschr. f. Geburtsh. u. Gynäk.*, Bd. lxxiii, Hft. 1) studied fourteen fatal cases of pulmonary embolism in Kehrer's Clinic with reference to the possibility of this procedure. Puerperal pulmonary embolism may result after spontaneous but especially after operative deliveries and in 50 per cent. of the former, women under thirty are affected. The postoperative embolism on the other hand is more likely to occur later in life. The diagnosis of severe cases of embolism is usually possible even where the primary thrombosis is not clinically demonstrable. In 65 per cent. of the cases death results without the slightest premonitory clinical signs. In 66 per cent. of all the cases of fatal pulmonary embolus examined, an anatomical obstruction of the pulmonary veins or its principal branches was found so that the indications for the extraction of an embolus were present. In over one-half of the cases a period of fifteen minutes or more elapsed from the appearance of the first symptoms of the pulmonary embolism to the time of death, so that in these cases Trendelenburg's operation might have been possible. Vogt believes that the indications for operative interference in such cases are more favorable than in postoperative embolism.

The Diagnostic Value of Roentgen Rays in Obstetrics.—Heynemann (*Ztschr. f. Geburtsh. u. Gynäk.*, Bd. lxxiii, Hft. 1) presents the results of his extended observations in Veit's Clinic and concluded that the procedure is not as well adapted to measuring the true conjugate diameter as the direct method. For the estimation of those pelvic measurements which cannot be determined by direct methods the *x*-rays are of invaluable and practical assistance. The principal value of the method consists in affording an idea of the form and contour of the pelvis, especially the inlet. An attempt should always be made to maintain the proper relations between the various parts of the pelvis in the picture. For this reason it is advisable to obtain a picture of all doubtful cases when they are not pregnant. Stereoscopic *x*-ray plates should be made whenever possible. The diagnosis of pregnancy can only be definitely established with the *x*-ray in and after the seventh month and before this time it is always doubtful unless exceptionally favorable circumstances are present. A differential diagnosis between intra- and extrauterine pregnancy by this means is of little value, likewise the diagnosis of malformations or cephalic measurements before birth. Other fields in which the *x*-rays may be employed in obstetrics are the demonstration and treatment of fractures in the new-born, the study of monsters, medicolegal evidence of stillbirths, the presence of foreign bodies in the genitals and the demonstration of the urinary tract. With proper care no harmful effect on the pregnancy need result. The diagnostic value of *x*-rays in obstetrics however cannot be considered a substitute for other methods of examination but only to confirm such findings.

Rupture of the Uterus after Pituitrin.—Herz (*Zentralb. f. Gynäk.*, 1913, No. 20) reports a case of uterine inertia after prolonged labor in a young primipara who also presented a flat, rachitic pelvis. The fetal head was in midpelvis and the cervix two fingers dilated and rigid, when 1 c.c. of pituitrin was injected. Within a few minutes the pains became stronger and after a period of twenty minutes became tetanic in character. About an hour later the patient collapsed after a very severe pain and presented evidence of uterine rupture. The pains continued and she gave birth to a very much asphyxiated infant. The placenta was delivereds pontaneously. Subsequent examination showed that the cervix was entirely separated from the lower segment of the uterus and the fetus and placenta had been born through the tear. The parametria were involved on either side. The vagina was packed and the patient treated expectantly. Two weeks later an examination showed fairly good union of the lacerated area. The case shows that pituitrin should not be given in the presence of an insufficiently dilated cervix.

Inflammatory Nature of Chorioangiomata.—E. Planchu and P. Savy (*Arch. mens. d'obst. et de gyn.*, March, 1913) from their study of chorioangioma or benign placental tumor, arrive at the following conclusions. Chorioangiomata of the placenta should be considered as inflammatory lesions. Histological examinations show in the neighborhood of the tumor the presence of thrombosed vessels, and infiltration of the placental tissue by inflammatory cells. Some pathogenic cause produces a vascular alteration with slow and progressive obliterating thrombosis of some vessels, resulting in dilatations and hyperplasia of the capillaries, becoming angiomatous. The alteration is similar to that in an infarct; there is a slow obliteration of the placental vessels allowing of the establishment of a compensatory circulation and avoiding hemorrhage by rupture of blood-vessels. Clinically the increase in weight of the placenta, the coexistence of hydramnios, the premature interruption of pregnancy, the liability of the fetus to death are all in favor of the frequent syphilitic nature of these tumors.

The Human Placenta in Cholera.—Stephano Pestalezza (*Ann. di. obstet. e gin.*, April 30, 1913) tells us that acute infectious diseases always cause changes in the placenta when pregnancy coincides with the diseases. In the epidemic of cholera of 1911 he had the opportunity of examining four placentas removed during labor or after abortion, and examined when fresh. Three of these cases were rapid and violent cases of cholera with pregnancy at or near term. One was a spontaneous abortion at the fourth month in a severe case. Examination showed a marked congestion, hemorrhages of various amounts, and diffuse degeneration of the cells covering the villi. These lesions were limited to the placenta. If the case is not rapidly fatal and the placenta remains for some time in the uterus there is added to the degeneration an inflammation having the characteristics of an acute decidual endometritis. In acute cases the hemorrhages are marked; in chronic cases the degenerative changes predominate. The bacillus is never found in the placental tissues, thus cholera is not transmissible to the fetus through the placenta. The lesions in the placenta are not the result of the presence of the bacillus, but of the toxic products of the disease, and the increased blood pressure, and labor comes on assisted by the peripheral muscular contractions.

Salvarsan and Neo-salvarsan in Pregnant Women, Women in Labor, and New-born Infants.—J. Lemeland and H. Brisson (*Arch.*

mens. d'obst. et de gyn., March, 1913) find that salvarsan and neo-salvarsan have an undeniable action on syphilis in the puerperal state; it causes rapid cicatrixation of secondary lesions, and even of the primary sore, and disappearance of the treponema. To get good results we must use medium doses, one or more times. The reactions are in relation with the dose injected; great care should be used in the dosage, since large doses are injurious to mother and child. One should never give a second injection until sure that the arsenic has been eliminated normally. Neither salvarsan nor neo-salvarsan in appropriate doses definitely produces a negative Wassermann reaction. It is common to see the reaction lessen in activity after the dose, but increase again soon afterward. Only that patient can be considered cured who has given a negative reaction for a considerable time under the influence of salvarsan. The good effect of these drugs on the fetus is real, but their use may not be entirely without danger. A negative reaction to the Wassermann is not a positive indication that syphilis was absent. The action on the fetus is variable, being especially favorable in subacute cases. In severe infections the drug is too strong and dangerous to the child. Neo-salvarsan seems to produce a deeper and more dangerous effect on the organism than salvarsan. At present its use is not justifiable. It is possible that these drugs favor the action of the syphilitic virus on the nervous system. The difficulties of preparation, the necessity of careful observation of the elimination of the arsenic, the dangers to which it exposes the patient make this medicament one to be used exceptionally and not too generally applied.

Histological Examination of the Uterine Cicatrix after Cesarean Section.—Audebert (*Ann. de gyn. et d'obst.*, May, 1913) quotes Couvelaire as saying that the cicatrix in Cesarean section is always fibrous, not muscular, and therefore always forms a weak point in the uterus, the tearing of which is to be feared in later labors. The uterus should, therefore, be removed after the first section for fear of bad consequences from a second labor. In a case operated on by the author in which, at the first section there was infection of the uterine wound, the uterus was removed at the second section for fear of later rupture. This cicatrix was carefully examined microscopically. The labor was the fourth that the patient had had, and she had a rachitic pelvis. Three labors had been by artificial delivery or section. The second incision was found to be parallel to the scar of the former one, and about 5 millimeters from it. To the naked eye the cicatric appeared normal, forming a ridge both within and without the uterus. It appeared to have united by first intention. Microscopically there were found interlacing muscular fibers, many of them crossing from one side of the cicatrix to the other, and having the appearance of normal muscular fibers. The cicatricial tissue was hardly recognizable and repair was complete. The author concludes that in some cases, in spite of infection, we got a true muscular repair of the uterine cicatrix in Cesarean section.

Aberhalden's Biological Test for Pregnancy.—In cases studied by P. F. Williams and R. M. Pearce (*Surg. Gyn. and Obst.*, 1913, xvi, 411) the use of Abderhalden's test for pregnancy, employing the dialysis method and the ninhydrin color reaction, gave positive results with each of twenty-eight sera from pregnant women and eight from women in the postpartum period, including one after abortion. The test was never negative in a known pregnancy. On the other hand, the serum of pregnancy reacts with tissues (kidney, heart, uterus) other than placenta, and indeed with other than human tissues (*e.g.*, dog's kidney). Also sera of two cases of nephritis, one of tabes and one of infection (carbuncle), and occasionally of some individuals apparently in perfect health, gave the reaction with placenta and other tissues. In the use of Abderhalden's dialysis method the writers found the ninhydrin reaction far superior to the biuret reaction. It is also important that Schleicher and Schull's smaller dialysis sacks should be used rather than the fish-skin membranes originally recommended. Results as satisfactory as those by dialysis are obtained by mixing tissue and serum in tubes, and after incubating for twenty-four hours, testing the filtrate obtained on coagulation by heat and acetic acid with ninhydrin. Inactivation of the serum causes a great diminution in the degree of reaction but does not cause it to disappear entirely. At zero temperature no reaction occurs. The power of a serum to cause the reaction persists, when the serum in kept under proper conditions of temperature, for at least seven days. Abderhalden's dialysis method cannot be accepted as an accurate clinical method until it has been more thoroughly investigated and the possible sources of error corrected.

C. P. McCord (*Ibid.*, 418) says that the value of the test lies not so much in the positivity of the test as in the relative negativity of the control. Contrary to Adberhalden, in animal work controls were nearly always faintly positive, even when all mechanical sources of error were removed. This fact is very reasonable, for the blood contains amino groups in easily detectable amounts from digestive processes. Serum drawn at the height of food absorption contains more amino groups that are readily dialyzable, but even on starvation some serums give positive reactions after dialyzation. Further, in the case of pregnancy blood may be drawn just at the time of intracorporeal digestion of chorionic villi from the patient's own placenta. In this case the digestion would continue extracorporeally, and give rise to a positive test. A test, to be positive, must, after removal of mechanical sources of error, give a more pronounced coloration than the control. The writer's results are based only on laboratory experiments. These yielded about 95 per cent. of accurate tests. These were followed up by autopsy and exhibition of the fetuses or the demonstration of nonpregnancy. Errors of technic account in the main for the remaining 5 per cent. In the presence of unquestionable pregnancy, negative tests occurred in two experiments. The test is apparently more accurate for human subjects than for animals, in that the controls are many times negative or only faintly positive in women, while in laboratory animals the blood serum normally dilayzes to the extent of giving positive findings in the controls. The decision between positive and negative tests is never doubtful in the human. These observations are based on 240 tests under varied conditions and at different stages of pregnancy. The author concludes that the serodiagnosis of pregnancy is both reliable and practical.

Excretion of Amylolytic Ferments in the Urine during Toxemias of Pregnancy.—D. Corbett (*Jour. Obst. and Gyn. Brit. Emp.*, 1913, xxiii, 227) has studied the stand-reducing ferment which is excreted in human urine by the quantitative method employed by Wohlgemuth. Soluble starch and saline solutions are added, in a series of dilutions, to the urine, which is then heated in the water-bath for one-half hour and subsequently chilled. Undigested starch is then tested for with a solution of iodine. The writers find that we may, from an examination of the ferment content of the urine, divide cases of eclampsia into two main groups: 1. Primarily renal type—where the toxin has some special affinity for the renal epithelium—either following the typical albuminuria of pregnancy where the kidneys have been damaged for a comparatively long period, or as a more acute condition. Here we may expect low readings, together with much albumin in the urine. The diastase value for the serum may exceed that of the urine. Whether there may be a relative increase in the ferment content of the serum or urine before eclampsia supervenes, is not at present known. 2. Secondarily renal type—where the damage to the kidneys is of less importance. There may be changes in the liver and possibly in the pancreas. The liver changes are shown by the presence of bile acids and leucin in the urine. There are also other evidences of disordered metabolism, such as the excretion of acetone and diacetic acid. Here during the eclamptic period there will be a large percentage of albumin in the urine together with high diastase values for the serum and urine. We have in this method a means which might on further researches be of value both in the diagnosis and prognosis of the toxemias of pregnancy. It may show that a lesion of the pancreas is in some way associated with eclampsia.

Pseudoeclampsia.—H. Croom (*Jour. Obst. and Gyn. Brit. Emp.*, 1913, xxiii, 213), records two cases which closely simulated eclampsia, but in both of which cases the feature of toxic eclampsia, namely, urinary changes, was entirely absent. A clinical picture very similar to that of eclampsia may occur in cases of diseases of the meninges, cerebral tumors, some forms of epilepsy and hysteroepilepsy. It has always been a difficulty to account for the occurrence of eclampsia without any urinary change. Such cases are recorded in most text-books as cases of eclampsia without albuminuria. Recognizing as is now done, that eclampsia properly so-called is toxic in its origin, the absence of albumin would, *a priori*, render the diagnosis of a pure eclampsia untenable. Want of differentiation of these cases has led to quite a number of cases being recorded as eclampsia which were not at all toxic in their origin, and no doubt has led to a very considerable misinterpretation of the value of various methods of treatment.

Treatment of Eclampsia in the Working Classes after the Stroganoff Method.—Alfred Strumpel (*Zeit. f. Geb. u. Gyn.*, Band lxxxiii, No. 2) says that among peasants in isolated communities it is not easy in cases of eclampsia to remove the woman to a properly managed maternity hospital, as should theoretically be done in this serious disease. There may be no hospital within many miles, and no means of rapid removal when one is near. Therefore it is necessary in these cases to treat the disease in some manner that shall give reason to hope for life for mother and child. The author has had an unbroken series of four recoveries in eclampsia under the use of this method. The author insists that the room be made dark and quiet, and all persons except those taking care of the patient be excluded from the room and house. He first injects into the rectum Stroganoff's chloral solution, using a syringe holding 10 grams, and injecting one to four syringefuls. As soon as the power to swallow has returned after the convulsion, he gives the same solution by mouth, and morphine by hypodermic or mouth. The husband or the midwife may now watch the case, keeping in telephonic communication with the physician. The effect of the treatment is to calm the nerves, stop the convulsions, increase the urine, lessen the albumin and permit of feeding with milk.

Pituitary Extract in Obstetrics.—Arnold Fuchs (*Zeit. f. Geb. u. Gyn.*, May, 1913) says that when pituitary extract was first introduced it was with the feeling that it was an absolute specific for exciting uterine contractions. Although this hope has not been fulfilled, it has been found of great values in obstetrics. The author gives histories of six cases treated by him with pitulegland, a preparation in which 1 c.c. of the solution corresponds to 0.1 of the gland. It was used by intramuscular injections. The cases were one of primary inertia with hydramnios, two of secondary inertia, with abnormal presentations, one of instrumental abortion by bougies, one of placenta previa lateralis with premature rupture of the membranes, and one of ten weeks, abortion to remove the ovum. The author finds that by the use of the extract the uterine muscle is quickly stimulated to contraction, so that the other means used for delivery are facilitated. It increases the contractility of the bladder so that catheterization is not needed, it assists the bowel to act, and it aids the heart and increases the blood pressure. Thus it is of notable assistance, although not infallible in its action.

GYNECOLOGY AND ABDOMINAL SURGERY.

Physiology of Milk Secretion. E. A. Schäfer (*Med. Press.*, Mar. 19, 1913) says that the flow of the mammary secretion is induced as the result of galactagogue hormones circulating in the blood. Such hormones are produced in largest quantity in the posterior lobe of the pituitary body, but are also yielded by the corpus luteum, by the involuting uterus, by the lactating mammary gland itself, and, perhaps, by other organs. Hormones which are formed during pregnancy in the tissues of the fetus and in the placenta possess the property of inhibiting the activity of the galactagogue hormones. There is no distinct evidence that the mammary secretion is directly influenced by the nervous system, for the secretion is carried on in a normal manner after severance of all the nerves passing to the organ. Since the fact is well ascertained that nervous influences do affect the milk, this can only be either by their influence on general nutrition or by their effect on the production and pouring out of the galactagogue hormones. Drugs such as pilocarpine and atropine which probably influence the secretion of glands mainly if not entirely through nerve endings, have little or no direct influence on the secretion of the mammary gland.

Continuous Intravenous Infusion.—Friedman (*München. med. Wchnschr.*, 1913, No. 19) calls attention to the value of this procedure as a substitute for subcutaneous and intramuscular infusion of saline, as being less painful and quicker in its effects. The rectal infusions by the drop method, although valuable, are not applicable in certain cases on account of weakness or inability to retain the fluid in the rectum. The technic advised for the continuous infusion is carried out as follows: A glass canula is introduced into the median basilic or median cephalic vein and held in place with adhesive straps. The canula is connected with a glass funnel in the course of which a glass bulb is inserted so that the rapidity of the flow may be seen. The latter is regulated by means of a clamp and the patient's arm suspended in a vertical position. According to the quality of the pulse from two hundred down to fifty drops or less of fluid per minute are administered. In case cardiac weakness is present digitalin may be added or in the presence of vascular shock adrenalin. The infusions have been employed by the author for periods of from five to twenty-three hours and from three to five liters were used in the individual cases. The solution is given at body temperature and it is not necessary to provide any method for keeping the same warm. Friedman has employed the procedure in exhausting dysentery, ileus, carcinoma of the stomach, infectious diseases with marked collapse and vasomotor paralysis, including peritonitis and sepsis. The method was successfully employed in twenty cases without any complications.

Changes in the Viscosity of the Blood in Women.—Engelmann and Elpers (*Gynäk. Rundschau,* vol. vii, No. 9) discuss the behavior of this property of the blood in eclampsia as well as in other diseases of women. They used Hess's apparatus and found from an examination of twenty-nine cases in the last two months of pregnancy that the viscosity of the blood is considerably reduced, the average being 3.6 to 3.7 in contrast to 4.22 to 4.38 in the normal nonpregnant woman. In eclampsia the viscosity is markedly increased as a rule, for in eleven cases the average measurement was 5, corresponding to about 4 per cent. Venesection combined with intravenous infusion is an excellent method of reducing this increased viscosity and thereby reduce the damage brought about by such changes. In the different varieties of genital hemorrhage a more or less marked reduction of the viscosity of the blood results. The lowest measurement was 2.6 in a case of severe bleeding from fibroids. In the presence of inflammatory and purulent processes the viscosity is increased. Thus in ten cases the average figure was 5.45. In ten instances of ectopic gestation the average reduction in the viscosity resulted in a measurement of 3.73. In the newborn the viscosity was considerably increased over that of the maternal blood.

The Significance of Tetanus in Obstetrics and Gynecology.—Kehrer (*Arch. f. Gynäk.*, Bd. xcix, Ht. 2) presents an extensive review of this subject in which attention is called to the frequent occurrence of this condition notwithstanding the improvement which has resulted since the general adoption of antispasmodic and aseptic measures. From a close study of one hundred and eight collected cases it would appear that in certain years maternal tetany is more frequent than in others and the period of transition from fall to winter or winter to spring seems to predispose to its occurrence. In the treatment of this condition the more recent investigations show that the symptomatic treatment should be displaced because disturbances of the parathyroids and the relations of the disease to calcium metabolism have demonstrated the futility of the former. As the convulsions are readily excited some sedative measures must, however, be employed, among which morphine is the most efficient, although chloral and lumbar injections of magnesium sulphate solution have been found efficient. Chloroform and ergot are contraindicated in tetanic convulsions. Heat in the form of packs and baths and diaphoretic measures are very efficient. Kehrer believes that venesection is contraindicated in true tetanus notwithstanding its value in eclampsia, as the loss of blood rich in calcium increases the danger for the patient. In all cases it is essential to supply the body with large doses of calcium salts either by mouth or rectum. This may be done by a diet composed of large quantities of milk and nutrient substances rich in calcium. Tablets of parathyroid and the injection of an immune serum are indicated in all cases. In the tetanus which accompanies hemorrhages in gynecological cases as well as in that of the newborn, the best results are obtained by the administration of large doses of calcium. Kehrer has used this successfully in the form of calcium chloride given simultaneously by mouth and also by rectum in sugar solution.

The Thyroid as a Factor in the Etiology of Uterine Hemorrhage.—Sehrt (*München. med. Wchnschr.*, May 6, 1913) noting the observation frequently made that anemic women very often suffer from severe menstrual hemorrhages, was led to examine more carefully whether disturbances in the thyroid function have effect on the same. Kocher found that the blood of individuals suffering from a hypofunction of the thyroid underwent well-marked changes which included relative neutrophile leukopenia and also a relative or absolute lymphocytosis. The most marked characteristic which distinguishes the blood of the hyper- and hypofunctions of the thyroid is its coagulability. This property is diminished in Basedow's disease and increased in the hypofunctional conditions. Sehrt has made a further study of this subject in thirty-four pathological cases, using the blood from an arm vein and Schultz's coagulation tube. The cases included twenty instances of ordinary hemorrhagic conditions without definite uterine changes, fourteen cases of various gynecological conditions accompanied by hemorrhage and several cases of normal menstruation. In the first group a relative neutrophile leukopenia was absent in only four instances and the coagulation time reduced in all the cases except one. In thirteen women out of this group well-marked evidences of a hypofunction of the thyroid were present. The writer believes that the disturbance in the relations between the thyroid and ovary are probably the basis for the anatomical, and as yet unexplained, hemorrhages which often occur, and that in these cases we are dealing with abortive forms of myxedema. It is also probable that a close relation exists between an insufficiency of the thyroid secretion and the convulsions of pregnancy, for here we meet with similar changes in the blood picture.

Control of Asepsis in Gynecological Operations.—Sigwart (*Arch. f. Gynäk.*, Bd. xcix, Ht. 2) presents the results of the routine bacteriological examinations done in laparotomies in Bumm's Clinic. The procedure now employed differs from that which was developed by Liepmann under the name of "dreitupferprobe." Sigwart employed not only a bouillon culture but also agar plates. He reports on one hundred and fifteen major abdominal operations, among which there were forty-three aseptic and seventy-one septic cases. The former showed the presence of streptococci in two cases with more or less infection of the wound in three cases, none of which, however, were fatal. In the septic cases streptococci were found in twenty-three, among which there were six fatalities, although only two of these occurred among the lot in which streptococci had been demonstrated. These results seem to show that no operation can be conducted with complete absence of bacteria. In four cases in which the peritoneum was infected with germs other than staphylococci and in which streptococci were found, underwent a smooth convalescence, likewise six women in whom streptococci were found in bouillon cultures. Among the latter hemolytic streptococci were found in pure culture. It would appear, therefore, that no definite prognosis in an individual case can be formulated from the bacteriologic findings at the time of operation, for even in the presence of very virulent infections the streptococci which lead to a fatal peritonitis are not found either in bouillon cultures or agar plates. On the contrary large numbers of streptococci, some even with hemolytic properties, may be demonstrated without any peritoneal infection following later on. Sigward believes that the reason for this inability to form a prognosis in the individual case is due to the fact that we have no method by which the virulence of the bacteria may be definitely established, as there is no doubt of the protective power of the healthy peritoneum against germs of slight virulence. It is essential that all wounds in the connective tissue and the pelvis are thoroughly covered and that no raw surfaces project into the peritoneal cavity. Where it is impossible to cover raw surfaces with peritoneum the intestines should be used for the purpose. Drainage of the free abdominal cavity has been practically abandoned in Bumm's Clinic.

The Clinical Significance of Ruptured Graafian Follicles.—Cohn (*Arch. f. Gynäk.*, Bd. xcix, Ht. 3) presents a study based on the personal observation of several cases and a study of the literature, from which he concludes that the site of the rupture of a Graafian follicle offers a free communication between the interior of the same and the abdominal cavity. Even after partial closure has occurred these places may again break open. It is well known that severe hemorrhage may result both during and before the formation of the corpus luteum. Such intraperitoneal hemorrhages may threaten life, although if of slight degree are without symptoms. However, even these may result in the formation of hematoceles and adhesions to neighboring structures. The site of the rupture may also serve as a point of entrance for organisms into the corpus luteum, among which the gonococcus and the tubercle bacillus are most frequent. Cohn also claims that the production of metastatic deposits of malignant tumors is particularly liable to occur in the corpus luteum through the medium of the rupture.

Blood Changes During Menstruation.—Cantoni (*Arch. f. Gynäk.*, Bd. xcix, Ht. 3) in commenting on the differences of opinion regarding coagulation and reaction of the blood during this period, presents the results of his personal investigations in which he used the method recently proposed by Wohlgemuth for estimating the coagulability. This method depends on the estimation of the smallest quantity of ferment which is sufficient to produce the coagulation of a definite quantity of fibrinogen in a given time. Cantoni found that the coagulability and the reaction of the blood remained unchanged during the menstrual period, but that the albuminoid content of the blood serum underwent a slight increase during the highest phase of the hemorrhagic phase.

Radiotherapy of Uterine Fibromata.—A. Siredey (*Rev. de gyn. et de chir. abd.*, Feb., 1913) has followed for three years fifty-nine cases of uterine fibroids treated with *x*-rays, of whom fifty-six continued under treatment for a sufficient time to show results. The principal indication is to arrest hemorrhage and pain. The tumor is undoubtedly reduced while these effects are being obtained. Although none of these tumors has entirely disappeared, all have been reduced, while the comfort of the patient has been much increased, and the hemorrhages lessened. The author considers this the treatment of choice for hemorrage at the critical age, which is always the age of uterine sclerosis and sclerotic ovaries. Radiotherapy should not be used unless the diagnosis is established. The hemorrhages of fibroma are always menorrhagic. A continual loss of blood is in favor of cancer, and continual metrorrhagia is a contraindication for the rays. Large tumors, multilobed, and of rapid development at any age should be relegated to surgery. The same is true of those occupying the lower segment of the uterus. Cases with coexisting cystic ovaries, lesions of the adnexa of infectious origin, salpingitis, etc., should be treated surgically. The age of the patient is of capital importance. Not under thirty-five years should the rays be applied. They give best results at the menopause.

Chronic Appendicitis and Sclerocystic Ovaries.—L. N. Lepeyre (*Arch. mens. d.,obst. et de gyn.*, March, 1913), from observation of seventeen cases of appendicitis complicated with ovarian trouble, draws the conclusion that sclerocystic ovaries are always found accompanying chronic appendicitis. Incomplete operations in such cases are generally failures. Both ovaries and appendix must be removed in order to get a cure, a second operation being required when the operation has not involved both structures. The most complex operations have been found to yield the best results. Conservative ovarian operations give excellent remote results; in cases operated upon by ignipuncture and examined after several years the ovaries remain normal. Operation should always be done early in these cases. Sclerocystic ovaries are the cause of troubles not generally considered due to their presence; these are pain, spontaneous and menstrual, intermenstrual, dysmenorrhea, irregular and increased menstruation, and hemorrhages. The uterus may be displaced or prolapsed. Any operation for such a condition should be a complex one, acting on appendix, ovaries and uterus at the same time. It should be done early, and should preserve as much as possible of the ovaries. Median laparotomy should be substituted for lateral incisions.

Genital Functions of the Ductless Glands in the Female.—W. B. Bell (*Lancet*, March 22 and April 5, 1913) emphasizes the importance of all the internal secretions in the special economy of the female. He regards each of them as absolutely indispensable to the harmony of the genital functions, which are, therefore, not solely dependent on the functional activity of the special genital gland.

With regard to the influence of the ovary on the uterus, to some extent the implantation of the fertilized ovum is assisted—possibly by the secretion of the corpus luteum. Further, the activity of the uterus is maintained and regular contractions are promoted, probably by the secretion of the interstitial cells. In the general metabolism the total ovarian secretion appears to promote the excretion of calcium and the retention of phosphorus. Total ovarian insufficiency arouses increased activity in most if not in all the other remaining ductless glands. Strictly speaking, the ovary is only concerned in the temporary function of reproducing the species; and, by its hormones or internal secretions, of bending the metabolism of the body to its purpose. As accessory to these functions the ovary has been supposed to influence secondary sex characteristics, but we have evidence that hyperplasia of the suprarenal cortex can upset any influence the female genital gland may be supposed to possess, and can produce in a female some of the secondary characteristics of the male, and even partially change the genitalia to complete the picture. Any nfluence the ovary has over the general metabolism is related to and dependent on its primary reproductive function. The rest of the ductless gland system is related to the genital functions in various ways. Some of the members—the thyroid, pituitary, and suprarenals—influence the development and subsequently preserve the integrity and activity of the genitalia. Others—the thymus, and possibly the pineal—appear to prevent sexual precocity. All the ductless glands control the metabolism in response to the necessities of the genital functions. But, in addition, they adapt the whole organism to the possibility of the situation, and regulate the secondary characteristics, both physical and psychical, to suit the needs of the individual. Once, however, the reproductive organs are removed or undergo atrophy, the primary genital functions of the rest of the ductless glands cease, and the rearrangement of the metabolism that follows produces what are known as the symptoms of the menopause. Contrariwise, insufficiency of the thyroid, pituitary, or suprarenals causes the cessation of the genital functions with atrophy of the uterus.

Ovarian Dyspepsia.—According to H. G. Webb (*Practitioner*, 1913, xc, 897) there occur among women of from twenty-five to forty-five years of age cases of acute dyspepsia, in which there is no evidence of appendicular trouble, and in some of which an appendicectomy has not even afforded a temporary relief, and with no evidence of previous menstrual disorders. There are generally vomiting, which may be very severe, giddiness, headache, and the facial appearance of suffering from severe eye-strain, although no errors of refraction are found. In some cases, there is a great deal of spasmodic backache, not connected with retroversion of the uterus. There is tenderness of one or both iliac fossæ and a great deal of tenderness in the fornix corresponding to the affected ovary. Hot vaginal douches help the condition very considerably, and so does prolonged rest in bed. On assuming the erect posture again, however, and commencing regular house-work, the old trouble at once recommences. In many such cases removal of one or both ovaries has resulted in a complete cessation of these symptoms.

After-results of Operation for Uterine Displacements.—Speaking specifically of hysteropexy and analyzing the results in 373 cases traced, A. E. Giles (*Proc. Roy. Soc. Med.*, 1913, vi, Obst. and Gyn. Sect., 192) finds that the general or local health of patients has been improved in 90 per cent. of cases; the position of the uterus has remained good in 96 to 98 per cent.; there have been records of sixty-two full-time confinements, with no complications that could be attributed to the operation, and including forty-seven natural labors; the uterus has kept in good position after labor in 97 per cent.; and the patients have been free of bladder disturbance or had no more than before operation in 85 per cent. of cases, 20 per cent. having actually improved. Hysteropexy is, therefore, a valuable procedure in cases of retroversion, prolapse, and procidentia, inasmuch as it is simple, safe, permanent in its effects, and not harmful in the event of subsequent pregnancy.

DEPARTMENT OF PEDIATRICS.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON PEDIATRICS.

Meeting of May 13, 1913.

HENRY DWIGHT CHAPIN, M. D., *in the Chair.*

TRACHEAL OBSTRUCTION DUE TO THYMUS GLAND.

DR. HENRY LOWNDES LYNAH reported this case which occurred in a child three and one-half years of age, who was admitted to Willard Parker Hospital on August 16, 1912. He had been ill for three days and had been intubated for laryngeal diphtheria by one of the ambulance surgeons prior to admission.

Physical examination showed the child fairly well developed and nourished, but with a lateral depression of the lower part of the chest and a prominent sternum. The pharynx was congested and there was a moderate amount of exudate on the tonsils and uvula. Cultures from the same showed the presence of diphtheria. The heart action was accelerated, but the muscular tone was good. On palpation over the lungs there was a peculiar tactile fremitus over the anterior aspect of the chest. There was an area of dulness in the interscapular region posteriorly extending downward for about 2 inches. There were scattered moist râles, mucus clicks, and many transmitted sounds through the chest, as was usually the rule in intubated patients. The abdomen was prominent. The temperature was 101° F., pulse 150, and respirations 32.

A dose of 10,000 units of antitoxin was administered. On August 19, three days after admission, the temperature rose to 103.4, pulse to 160, and respirations 60. There was an area of consolidation over the right lower lobe posteriorly. On August 22 the intubation tube was removed but it was necessary to reintubate in thirty minutes owing to a spasm of the adductors. On the 29th the condition of the patient had slightly improved, but the area of consolidation remained unchanged. This day the tube was autoextubated again and it was necessary to reintubate for twelve hours. By September 10 the general condition of the child had improved, although the physical signs in the chest remained unchanged. There was slight evening rise in temperature. A von Pirquet reaction at this date was negative. The intubation tube was now removed permanently. Five days after the extubation there was slight stridor, the lungs showed areas of bronchial breathing over both lower lobes posteriorly with many rude ronchi over the anterio-lateral aspect of the right lung. Dulness shaded off to flatness over this area and an exploratory puncture with the aspirating needle was made but no fluid obtained. On September 21 the child was discharged at the request of the parents but under protest. On November 2, 1912, the patient was readmitted to the hospital suffering with a violent spasm. He was reintubated and received a second injection of antitoxin. There was no anaphylactic shock. The tube remained in for a week, when it was removed, and the patient was discharged from the hospital at the end of three weeks. In the early part of January the child was brought to the hospital for the third time. After obtaining the history of the child, Dr. Lynah said that he had concluded that the recurrence of the dyspnea was due to subglottic hypertrophic laryngitis. In making the examination of the larynx, the applicator passed through the larynx but met with an obstruction in the trachea, the child becoming cyanotic. After removing the applicator a quantity of thick, ropy, foul-smelling mucopus was coughed out which gave some relief. Cultures of this expectoration showed no tubercle bacilli but staphylococcus in abundance. The chest signs were similar to those recorded previously. He did not doubt the existence of a chronic process and thought that there was probably a bronchiectatic cavity at this site. The left lung showed emphysematous areas and the percussion note posteriorly was of extremely high pitch. The area of cardiac dulness was somewhat increased and the apex beat was just below the nipple. The child was wheezing like an asthmatic. He found that the child had been asthmatic from birth, but at times became very cyanotic and would break out with cold clammy sweats. Dr. Lynah said he now suspected thymic asthma and once more percussed the chest. There was an area of dulness over the upper end of the sternum, the upper limit at the first intercostal space extending forward to about the fourth interspace, the lateral diameter from 3 cm. to the right of the median line and 2 cm. to the left. He now felt convinced that he had a case of enlarged thymus gland with pressure symptoms with which to deal. This diagnosis was confirmed by *x*-ray plates. The mother having been convinced of the real cause of the trouble would not allow any surgical interference, nor would she allow the child to be reintubated. Thus far all he had done was to give urotropin internally which seemed at first to improve the mixed infection in the bronchi, and later mixed staphylococcus vaccine was given. Should the mother at any time give her consent to operative interference, he proposed to do a Veau operation for resection of the thymus. So far there had been fifty cases reported with a mortality of 33 1/3 per cent. and many of these died several days after operation.

The interesting points of this case were that the dyspnea was relieved by intubation, but returned shortly after removal of the tube, and that the patient being of the type associated with status lymphaticus could receive two injections of antitoxic sera without any anaphylaxis and with only a slight erythema following the administration of the first dose. It was a question whether the case was one of laryngeal diphtheria or of tonsillar diphtheria with thymus involvement.

A CASE OF BILATERAL EMPYEMA THORACIS TREATED BY SUCCESSIVE RIB RESECTIONS.

Dr. Abraham Zingher said that this patient was a child six and one-half years of age who gave a negative family and past history. He was taken ill suddenly on November 8, 1912, with an acute bilateral bronchopneumonia. The disease ran a severe course with high temperature, marked prostration, and rapid emaciation. He had seen the patient for the first time on November 29, when the general condition was poor and the temperature was running a septic course, but no signs of fluid were present in the chest. Both lungs showed the presence of numerous crepitant and subcrepitant râles, with an associated patch of impaired resonance.

He saw the patient again in consultation on December 13, thirty-five days after the onset of his illness. There were some doubtful signs of fluid in the left chest and the aspirating needle revealed the presence of pus. A part of the eighth rib was resected the same night and tubes inserted for drainage. Some improvement followed during the next two weeks, but on January 7, 1913, flatness was detected in the right chest and operation showed the presence of pus on this side also.

On January 8, 1913, intercostal incision was performed on the right side and tubes inserted for drainage. This was at first profuse, but soon became scanty and imperfect, and a secondary resection was performed on February 1, 1913. The patient made an uneventful recovery after this, gaining in weight and strength, and was discharged from observation on April 1. A light ether anesthesia was employed in all the operations. On opening the right chest the patient went into shock but quickly rallied under active stimulation.

The pneumococcus was found in the pus on both sides. The general course of these cases was as seen in the one reported here, and in the majority of those found in the literature on this subject was that of bilateral or bronchopneumonia, complicated by a one-sided empyema. After the first operation the expected rapid improvement did not take place, the temperature with the developing signs of fluid in the opposite side of the chest pointed to the presence of pus in the other side. In such cases the interval operation was always performed. Where pus was detected on both sides simultaneously the question of opening the two sides came up; the danger, of course, was that of a double pneumothorax.

According to Hallin, who in 1905 collected 114 cases in the literature this danger, was exaggerated. He stated that through force of circumstances the interval between opening the two sides of the chest had become shorter and enumerated several cases where both sides were operated upon at the same time with good results. If one decided to wait, most authorities were agreed that it was better to operate upon the left side first so as to relieve the pressure on the heart and to avoid the danger of a complicating pericarditis. The pus from the right side could be aspirated and after several days the chest could be opened. Shock occurred occasionally, either at the first, or, more often, at the time of the second operation, and when it occurred it should be treated by active stimulation.

GLYCERINIZED VACCINE VIRUS.

DR. FRANK SIDNEY FIELDER said that on May 1 the Department of Health had given out an improved package. This vaccine on test had shown 100 per cent. success in primary vaccinations. It might be expected to retain its potency at least until the date that was given, probably longer. With one of the enclosed needles, one should scarify an area not over 1/16 inch in diameter, so as to draw a little serum. Then break off one end of the vaccine tube push the broken end into the rubber bulb through the small opening; then break off the other end of the tube. Place the finger over the opening in the large end of the bulb, expel the vaccine upon the scarified area, rub it in gently but thoroughly with the needle. Let it dry and then cover with the loose sleeve lined with a clean gauze or linen. He asked that a record be kept of the number of vaccine used for each vaccination. Each package contained five capillary tubes and this was very necessary when one had to administer more than one vaccination, and he hoped that physicians who were doing much of this work would buy these packages containing the five tubes.

VULVOVAGINITIS IN YOUNG CHILDREN, ITS CONTROL AND SUCCESSFUL TREATMENT.

DR. NATHANIEL BARNETT presented this communication. He stated that the frequency of this affection among children and the unsatisfactory treatment given in most of the ordinary dispensaries of the city had suggested to the authorities of Mount Sinai Hospital the establishment of a special clinic for the treatment of this disease. The writer had been placed in charge of this clinic and this paper was the result of his observations extending over a period of one year. They had found that vulvovaginitis was exceedingly prevalent in hospitals, and in schools where children used a common toilet the spread of the disease was favored. The homes of the poor were also favorable to the spread of this disease. He had found very little in the literature to help him in his work.

The material which he had studied consisted of fifty cases. In conducting the clinic the first point made was the considerate treatment of the patients. Two nurses were always present, one to assist in the work and one to take notes on the cases and to do social welfare work. The methods of examination suggested in the paper of Dr. Koplik written in 1893 were, in the main, adopted. A Skene urethral speculum was utilized to inspect the vagina and cervix together with the aid of a head mirror. Spreads of the secretion were taken before the various therapeutic procedures were instituted. Attendance at the clinic was three times a week and the nurses visited the homes and urged delinquent ones to attend regularly. At the same time home conditions were looked into and attempts were made to have the children isolated. In spite of these efforts only twenty-six of the patients continued systematic treatment.

Vaginitis was only serious when complications arose. As to etiology, they had classified their cases as follows: 1. Discharged from hospitals and other institutions, eighteen cases; 2. sleeping with mother, who had a vaginal discharge, nine cases; 3. sleeping with sisters, who had a vaginal discharge, five cases; 4. cases of unknown origin, eighteen. Many of the cases seen at the dispensary occurred in families where two or more children slept together, or with the parents. In the majority of cases the disease was discovered accidentally by the mother or the physician and the origin could not be discovered.

The disease was of varying duration. Some of the cases gave a history of recent origin; in others the disease had lasted for years, in one case for fully six years with a positive gonococcus finding in the secretions of the vagina. The chronicity and resistance to treatment of the affection was characteristic. The shortest duration of any case coming under their observation was one week. The average duration was eight and one-half months.

Their method of diagnosis was by the introduction into the vagina as far as possible of a platinum loop, with which the walls and floor of the vagina were scraped and the secretion obtained spread on a slide and stained with gram.

As to the seat of the disease, in most cases a small amount of dried pus was found on the labia, and pus was seen coming from the vagina, but the external appearance of the hymen might be normal in a pronounced gonorrheal process. The vagina was dull pink with pus present in the folds of the rugæ throughout its entire length and occasionally hemorrhagic spots were seen in the walls of the canal. In the cervix they found marked changes; it was in all cases deeply congested and pus was seen exuding from the cervical canal. Superficial ulcerations were occasionally observed on the anterior and posterior lip. The posterior fornix in some cases contained a certain amount of pus which bathed the cervix continually. These observations conformed with those made by Koplik in 1893.

In the present series of cases the following complications were present: Arthritis of the shoulder, once; arthritis of the wrist, once; chronic general peritonitis, once; pelvic peritonitis, twice; and painful heel, once. The patient in the latter case was eleven years of age, and an *x*-ray showed a periosteal exostosis. There was a burning sensation on urination in 30 per cent. of the cases.

The treatment of the condition in the past had consisted of irrigations, installations, local applications, vaccines, and illumination of the vagina with a speculum and treatment of the parts locally. In addition to the above the author had applied the electric endoscope, which, in his opinion, was a distinct advance in the management and treatment of these cases.

For the irrigations they had used potassium permanganate 1-1000, or bichloride of mercury 1-4000, or Lugol's solution of iodine 1-500. The alcoholic solution of pure iodine could not be used without causing pain and great discomfort.

For installations the solutions used were nitrate of silver 1/4 per cent. and argyrol 10 per cent. The applications were introduced with a cotton applicator and the vaginal wall swabbed, nitrate of silver 10 per cent. being used. Fourteen cases were treated with vaccines at intervals of from three to seven days in doses of from five to 100 millions. The injections were generally made in the buttocks. All of the above methods had received a painstaking trial and he had come to the following methods of treatment: The mother was instructed in preparing the permanganate douche and giving it. This injection as to be given in the home daily. The patient was put on small doses of urotropin daily. In the clinic the patient was treated with the electric endoscope. In administering this treatment the Kelly endoscope was inserted as far as possible, the size of the endoscope depending upon the size of the opening in the hymen and not upon the age of the child. The obturator of the endoscope was withdrawn, the light inserted, and with no other manipulation than withdrawing the tube 1/4 to 1/2 inch the cervix presented at the distal end of the tube. Any secretion was then removed with the applicator, and iodine (Lugol's solution) was applied directly to the cervix and vaginal walls as the endoscope was slowly withdrawn. These endoscopic treatments were carried out three times a week.

With any of the methods of treatment the discharge soon ceased, but this of itself did not constitute a cure, for smears remained positive for months after all visible signs of discharge ceased. Two negative smears at intervals of two weeks might be followed by positive ones so far as the gonococci were concerned. The smear taken from the posterior fornix might be positive, whereas the secretion obtained at the same time near the hymen might be negative. None of his cases treated with vaccines showed any improvement so far as the vaginal discharge was concerned. The cases complicated with arthritis improved rapidly and a complete cure followed the use of the vaccines, but the vaginal discharge did not diminish in either case. The painful heel was improved by the vaccine treatment, but there was a recurrence of severe pain at intervals. He considered the cases cured if smears take weekly were negative for three consecutive weeks. The patients even then must return monthly for examination in order that smears might be taken.

From his observations on the twenty-six cases, Dr. Barnett concluded that at the end of six months only seven cases could be said to have been cured by irrigation alone. Seven of these cases in which irrigations had failed were treated with the endoscope, and five of these were cured in one month. Five additional cases of the twenty-six which had failed to improve under the irrigations were now being treated with the endoscope and were improving rapidly.

The first important factor to bear in mind in treating this disease was the infection of the cervix and the difficulty of reaching this nidus of infection by the ordinary methods of treatment. Irrigation of the vagina was neither practical nor of great value. The affected parts were not reached directly and the treatment must be continued for too long a period of time, and even then the results were unsatisfactory because the solutions used were not of sufficient strength. Cures could be obtained by the treatment of the cervix as he had indicated in a short period of time and strong solutions could be applied to the cervix and vaginal walls directly without causing pain.

The prophylaxis in the homes of these children was very difficult to carry out, but one should insist that the child sleep alone, should have marked linen and underclothing, which should not be used for other children even after being washed. They should wear a vulva pad which should be frequently changed and should be taught to spread paper on the toilet seat and to keep their hands away from the genitals. In schools separate toilets should be provided for these children and this could only be carried out by invoking the aid of the Department of Health. Teachers and social workers should be taught that this situation was always present among children and that the method of acquiring the gonorrheal discharge was in most cases innocent.

COMPLEMENT FIXATION IN GONOCOCCAL INFECTIONS.

Dr. Archibald McNeil read this paper. He said that the technic of the complement fixation test for gonorrhea was identical with that of the Wassermann test for syphilis, with the exception that the antigens prepared from pure culture of gonococci were used. In cases of anterior gonorrheal urethritis in the male and acute vulvovaginitis in the female a positive reaction was practically never obtained. But shortly after the posterior urethra in males and the cervix and glands of Bartholin in females were involved the serum of the patient reacted positively.

After having tested between 3000 and 4000 sera taken from persons suffering from all stages and varieties of gonorrheal infection, the results seemed to justify the assumption that a positive reaction denoted the presence of recent activity in the body of a focus of living gonococci.

A positive reaction usually persisted for from six to eight weeks after a cure had been effected. It had also been found that antibodies disappeared from the blood of rabbits immunized to the gonococci in about the same period.

With regard to a negative reaction, it would seem that while one negative result would not be accepted as conclusive evidence of a cure, but that when persistently negative results had been obtained extending over a considerable period of time, it seemed safe to assume that a cure had been effected.

Dr. McNeil gave a detailed statement of the results obtained by this test in eight cases of vulvovaginitis in all of which the reaction was positive from one to four times. While these tests were too few to allow of very definite conclusions being drawn, they at least showed that infantile vulvovaginitis might be more than simply a local infection and that the infection might be active after all local manifestations had disappeared. In acute cases of vaginitis where the blood was negative and there was any doubt with regard to the identification of the gonococcus as the causative organism, antigens might be prepared from pure cultures of the suspected organism from the case and tested against a known antigonococcic serum.

This test was specific. With the present methods of preparing bacterial antigens there was no cross fixation even with a gonococcus antigen and an antimeningococcic serum or with a meningococcus antigen and an antigonococcic serum.

DISCUSSION.

Dr. Rowland G. Freeman stated that this common disease needed more attention than had been given it, especially since on account of the dread of its spread in institutions, there are few hospitals where such cases could be taken and properly treated. Moreover, when once in a hospital they were so resistant to treatment that they occupied the hospital beds for long periods. Thus with the thorough treatment as Mt. Sinai it was sometimes six months before they were cured. As to local applications there were none that seemed to be at all specific and it was usually good policy after having little reaction from one to try another. Possibly after the use of the endoscope, as described in the paper, better results would be obtained. While there was some difference of opinion as to the result of vaccine treatment it probably had done little if any good in the cases in which it had been tried.

Dr. Charles G. Kerley stated that he was very glad that the reader of the paper had taken up the work without preconceived ideas and was investigating the subject without prejudice. He had had considerable experience with vaccine treatment in thirty-six cases at the New York Nursery and Child's Hospital. In these patients the following method was used:

Fifty million of the dead bacilli (stock) were given. In five days another injection was given, each injection being increased 10,000,000 at a time.

Sixteen cases received from 350 to 1000 million.

Three cases received between 1000 and 2000 million.

Three cases received between 3000 and 4000 million.

Eight cases received between 4000 and 6000 million.

Six cases received between 6000 and 8300 million.

From his results he stated that vaccines did not seem to offer very much. He was quite sure that these case ran an indefinite sort of a course, the bacilli gradually becoming attenuated, and the cases cleared up spontaneously. This is why so few cases were seen in children after the third or fourth years. Comparatively few cases occurred in children after the tenth year. The results of treatment did not warrant us in flattering ourselves that these cases had been cured as a result of medical treatment.

Dr. Kerley stated that he had treated hundreds of these cases, using applications of disinfectants, irrigations of the vagina, etc. It seemed to him that his best results had been obtained in the use of vaginal douches of boracic acid solution, three times a day, at least 1 pint at a time and the parts carefully dried and then a dusting powder of 5 per cent. of boracic acid and equal parts of starch and zinc applied. It was his effort to keep the parts dry with this powder continuously.

In reporting cases Dr. Kerley said observation should cover a large number of patients, as occasionally one would have a run of very mild infections that would entirely recover in a very few weeks. Whatever line of treatment had been followed out would necessarily make the physician very enthusiastic concerning such treatment.

Dr. Henry Koplik had casually read the report from the Boston City Hospital and thought that the work they were doing there was in the right direction. These children with gonorrheal vulvovaginitis infected other children; this disease was a mild form of pest and even children in better circumstances became infected with this disease by the use of towels or manipulation, as the case might be. There was the social side to be considered as well as the medical side. The work in the dispensaries was in a way routine work but it was perfunctory. There was no doubt but that these cases of gonorrheal vulvovaginitis were self-limited, but at the same time it should be borne in mind that they infected others. At the Mount Sinai Hospital there were four cases of fatal gonorrheal peritonitis, the infection occurring through the vagina. One never knew when the disease would flare up and become dangerous to life. In these cases there should be a segregation of the children who had been exposed to the disease and the public should be educated in the means of stamping it out. Children afflicted with this disease should be, of course, kept apart from other children. Dr. Koplik had reason to believe that the authorities would eventually take up this subject; it had not received the attention it should to-day. In Europe they did not know much more about it than they did in America. However, this disease was not so prevalent abroad as it was in this country. The real question was, how to find out just how these children became infected. In the wards where every conceivable precaution was taken, with intelligent nurses who were very painstaking in their work, suddenly one or two cases of gonorrheal valvovaginitis would crop out and this showed how difficult it was to suppress the infection. Epstein tried to trace the infection at one time; he introduced into the vagina of children the pure gonococcus, but he failed to infect them. There was no doubt but that in the living secretions there was something that was communicable, but just what it was Dr. Koplik could not say.

He did not think it was right or proper for any institution to keep children afflicted with this disease away, because they were suffering even from an acute form of the disease, or because they might infect others; they had no right to do that. At the Mount Sinai Hospital they received these children in the wards but they took certain precautions; the children were not deprived of treatment when they might be seriously ill of some other disease. Of course, it was necessary to try to do all in their power to prevent the spread of the disease. This they could do, and by getting wards where the spread of the disease could be limited. At the hospital, however, they were by no means panicky about this disease. Even to-day they discharged children whom they knew had the disease; so far as he knew, and after very careful observation, a child thus discharged had rarely infected others. In other words, there was a large mass of children coming into the wards with simple vaginitis, but very few if any had been discharged who had infected others. Dr. Holt some time ago had pointed out that children apparently free from the disease had gonorrheal vulvovaginitis. Dr. Koplik had asked Dr. Barnett how many of these cases that appeared simple cases of vaginitis were really gonorrheal among the poor people. They believed that this was a self-limited disease, but it was one that could be stamped out.

With regard to the vaccine therapy in this disease, he did not believe that they should receive injections of so many thousands or millions of the dead bacilli and expect a cure.

He agreed with what Dr. Kerley had stated regarding their success in the treatment of this disease in young children; they were practically in a position where the therapy for this disease was far from efficacious. With Dr. Barnett he believed that they were in no position to sit down and treat cases in the wards unless they were permitted to do as Dr. Barnett proposed. At the Good Samaritan Dispensary they could not approach these children without a certain amount of timerity, different from what obtained in Dr. Barnett's clinic. The endoscope was used in these cases and with good results from a clinical standpoint. The tampon treatment had been used with more or less success with cocoa butter; this lasted for some time, came in contact with the gonococcus and was not very successful. This disease, however, he believed was spontaneously cured and he had under observation several children; these he had observed from birth until they were married, they were not sterile and had children. There was no doubt but that gonorrheal vulvovaginitis was a disease that resulted in very serious consequences and in fact was a pest in the public schools and in hospitals as well, and even the nurses were menaced. At the same time, whether the disease led to very serious consequences or not was a question. Dr. Koplik congratulated Dr. Barnett on his carefully carried out observations, and his openmindedness. There was no doubt but that many of these cases resisted practically all methods of treatment, and they seemed to be cases with a mixed infection. Some of them had a peritonitis, an arthritis, and other symptoms. He thought the Board of Health should take cognizance of this affection, especially when it occurred in the public schools.

DR. HENRY DWIGHT CHAPIN said that the action of the gonococcus as seen in infants and young children was somewhat different from adults, for they rarely saw any infection of the eyes or tubes and he recalled but one instance in which the ovarian tube had to be removed because of this disease. It may be possible that gonorrhea in the young is usually produced by a different strain of the gonococcus.

DR. MARTHA WOLLSTEIN said that gonorrheal vulvovaginitis was approached from the prophylactic standpoint at the Babies' Hospital where they thought they had almost solved the problem, but only by means of the greatest possible vigilance; the slightest relaxation of this vigilance was invariably followed by disastrous results. Every girl baby who applied for admission had a smear taken from the vagina and this was at once examined in the laboratory. If pus cells or gonococci were found, the child was not admitted unless she was so ill as to need immediate treatment. Then the child was isolated. These smears must be absolutely free of pus cells and Gram-negative diplococci. During the past year sixty-three admissions were refused because the vaginal smear was not clean. Vaginal smears from all girl patients in the hospital are examined once a week. Some years ago, when, in spite of the precautions taken, they had an epidemic of gonorrheal vulvovaginitis, they had used the vaccines, both the autogenous and the stock varieties, and had injected the vaccines according to the opsonic index, but their results were not encouraging. They now had cases come in only occasionally. In a recent paper Dr. Spaulding had called attention to the long period, of latency, as well as to the numerous recurrences among the prolonged cases of gonorrheal vulvovaginitis. Cases no doubt were admitted to the hospital during this latent period, as in the following instance.

A child was admitted to the hospital with a clean smear. At the end of the first week, the smear was still clean, but during the second week pus cells appeared, and the child was kept under observation. At the end of three weeks more pus cells were found, and at the end of the fourth week gonococci were found as well. During the stay of this child in the hospital, no other case of gonorrhea was in the house nor did any develop after she left. When the examination of the smears was positive of the disease, the child was sent home. Simple vaginitis occurred rarely as compared to gonorrheal vaginitis, but there were some cases that were undoubtedly due to streptococci or staphylococci. These cases clear up readily and do not have the recurrences characteristic of the gonorrheal cases.

The smears must be taken from within the vagina and must be free from stool contamination.

Dr. H. B. Wilcox, reporting the experience of the Children's Service at Bellevue, said that though there was a ward devoted to the treatment of vaginitis at Bellevue, the main therapeutic effort at that institution was prophylactic. All of the methods of treatment mentioned by the others in the discussion had been tried more or less thoroughly at Bellevue. The disease had been controlled but it had not been cured. No success had followed the use of commercial vaccine. Although difficult to obtain the material, it was thought that autogenous vaccines offered the best means of permanently eradicating the trouble. No permanent result had been obtained from the use of lactic acid gauze packing, argyrol or iodine suppositories. Prompt relief from the profuse discharge and the attendant discomfort had been obtained by douching with potassium permanganate, and daily argyrol suppositories. This was the present routine treatment of the cases at Bellevue.

On admission smears were taken and must show either cellular elements or bacteria during the three days' detention of the children before they were allowed to be sent upstairs to the ward. The method of taking these smears was most important. Often with a negative smear from the introitus gonococci were found in great numbers in the vault of the vagina or the cervix. The cases which escaped detection on admission later became the sources of ward epidemics and were usually those which had had only a superficial examination. The use of a small speculum, enabling one to reach the vault of the cervical canal directly, should be insisted upon. Negative cultures taken in any other way at Bellevue were considered nonconclusive. If such care were used in obtaining material for examination, most cases of simple vaginitis could be demonstrated to be due to gonococcus infection. Seldom were any complications of the disease noted on this service.

Dr. Louis Fischer said that at the Willard Parker Hospital they handled hundreds of these cases of gonorrheal vulvovaginitis. Probably 10 per cent. of those admitted with scarlet fever had the disease. These cases were very distressing to those who had to care for them whether treated outside or in the hospital. Dr. Huddleston had used stock vaccines but the results of this treatment were not at all gratifying. At the present time they were using local treatment, irrigations of magnesium, of alum, and of plain water. In a large series of cases that had bothered him for some time, he obtained good results by instituting a treatment in the form of arsenic and cod-liver oil. He found they were greatly benefited by the use of cod-liver oil, arsenic, iron and sometimes by a change of air.

Dr. B. Wallace Hamilton had been very much interested in the discussion and especially what had been said regarding the use of the vaccines. He was also impressed very much by Dr. Barnett's treatment of gonorrheal vulvovaginitis in young children. He was interested in hearing the statement made that this was a self-limited disease; but this latter statement he was going to question a great deal. He had seen many cases that came to the clinic after the disease had run a long time, two to five years or more, and still were not cured. He had noted the fact that some cases would recover without any local treatment whatsoever. Keeping the vagina clean externally and instructing the mother would help them in the care of these unfortunates. Many cases without irrigations, or any topical applications at all, would recover. These children with their vaginal discharges could have but a short duration of the disease, with excellent results, from the use of vaccines alone with no local treatment whatever; but if the case was of long duration the result of the vaccines was not so good. However, what had been accomplished by the use of the vaccines in gonorrheal vulvovaginitis offered them great hopes. There were many cases that would not do well under vaccine treatment, nor under any treatment whatever. But he still was of the opinion that vaccines did play an important part in the treatment of this disease. In fact, Dr. Hamilton said he was still enthusiastic regarding the treatment of the acute cases by vaccines. He has treated over 900 cases at the Vanderbilt Clinic in New York.

Dr. George Dow Scott had been interested for a long time in the use of the vaccines and sera in the treatment of diseases and one reason was that he had not noticed that the average physician gave this treatment the place it belonged, many thinking that the vaccines and sera were no good at all. In the treatment of certain arthritides the use of the vaccines often gave excellent results.

In Boston they used to get a great many cases of gonorrheal vulvovaginitis in one ward, and many were entered with this disease who came because of measles, scarlet fever, diphtheria, etc., and many had been infected with the gonococcus when young infants or young children.

An important point in the treatment of these cases was the following, and he did not think he should be subjected to ridicule for bringing it up. After washing out the vagina with water, flush it with pineapple juice. Excellent results could be obtained in these cases by the use of argyrol and pineapple, a splendid sterilizer of the vagina. This in his hands had given most excellent results.

Dr. Nathaniel Barnett closed the discussion and said that by endoscopic examination it was almost possible to make a diagnosis without smears. For in gonorrheal cases the cervix had an entirely different appearance than in those who were not affected with the disease.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Metabolism of Child with Complete Absence of Bile from the Intestines.—After removal from a boy of four years of a cyst, the size and shape of a large grape fruit, adherent to the liver above, to the colon on the inner side, and to deep structures posteriorly, the wound drained bile profusely, the stools became and remained bulky, clay colored, almost white, and had a metallic luster, an acid odor and acid reaction, and on all but a few occasions were free from bile. Microscopic examination of the stools showed a great excess of fats, no starch and no meat fibers. The child lost weight for a month and then on reduction of the fat in his diet steadily gained. He was at no time jaundiced and the urine never showed bile. From a metabolic study of this case by W. S. Porter (*Amer. Jour. Dis. Child.*, 1913, v, 388) the conclusions are: 1. Nitrogen metabolism is normal. 2. Fat metabolism is greatly reduced; the presence of bile is necessary to normal fat metabolism. 3. A child, not otherwise ill, but unable to digest fat on account of absence of bile from the intestine, can, if stomach and pancreatic functions are normal, digest sufficient protein and carbohydrate to maintain nitrogen equilibrium and to gain weight. 4. The negative urobilinogen test is evidence of complete absence of bile from the intestine.

Gastric Motility in Infants as Shown by the Röntgen Ray.—M. Ladd (*Amer. Jour. Dis. Child.*, 1913, v, 345) has based his observations on about fourteen cases or twenty-four series with about 124 plates. One of the most striking things observed is the curious lack of peristalsis to be seen in infants' stomachs as compared with adults. Only twice was the outline of the duodenum shown distinctly. The reason for this is not clear, unless it is that the food remains in the duodenum only a short time, and that the plates were taken at such long intervals, comparatively, that the duodenal stage was missed. In a case of normal digestion, if the plate is clear-cut, bismuth appears in the small intestines as soon as the feeding is completed, showing that a considerable amount of food passes into the duodenum without undergoing gastric digestion. The stomach appears to empty itself of the greater part of its contents in from one and one-half to two and one-half hours, the emptying process being more rapid in some cases than in others. After the greater part of the stomach contents has passed into the small intestines, a considerable residue remains, which is emptied very slowly, often remaining for four and one-half to five or even seven and one-half hours, in both breast-fed and bottle-fed babies. When a bismuth feeding is given and another feeding follows at the end of the regular two and one-half or three hour interval, the bismuth residue from the first feeding does not appear to mix intimately with the new feeding, but, as a rule, passes out into the small intestines much more quickly than it does when left to itself. The suggestion is strong that the distention of the stomach by a new feeding, if not excessive, stimulates peristalsis and favors the expulsion of the bismuth residue into the duodenum. On the other hand, if the distention is excessive, peristalsis may be inhibited and the emptying time of the stomach delayed.

In congenital pyloric stenosis the dilatation and peristalsis is marked; the pyloric end showing the same prow-like formation seen in adults. After a posterior gastroenterostomy the stomach appears to expel its contents through the artificial opening quite as rapidly as in the normal stomach, if not more so. As the opening of the pylorus is dependent on the secretion of hydrochloric acid in the stomach, the early appearance of bismuth in the intestines and the expulsion of the major part of the contents within two hours would suggest that the bismuth does not of itself interfere with the normal motility of the organ. Moreover, the plates showed in one series that the bismuth had disappeared from the stomach, in one experiment in two and one-half hours, in another in seven and one-half hours—the difference in the emptying time being due presumably to differences in the composition of the food, the amount of bismuth being the same in both cases.

Amyotonia Congenita.—The case described by N. C. Foot (*Amer. Jour. Dis. Child.*, 1913, v, 359) occurred in the eighth child of Jewish parents whose first two children were paralyzed at birth. The present child was born at term, with instruments. Fetal movements were first felt after the fifth month, a month later than in the mother's normal pregnancies, and were always very feeble. The child was limp at birth, did not cry until spanked and then only feebly. It moved neither arms nor legs, its hands were clenched, it breathed, "like a cat that wished to vomit." After a few weeks the hands opened out, the child using its fingers fairly well, the diaphragmatic type of respiration became less evident and was superseded by normal breathing up to the time of onset of the bronchopneumonia. The early paralysis gave way to definite improvement. Movement in the arms and legs became progressively better up to a certain time and then stopped. Electrical treatment and massage benefited the child but little.

A few days prior to admission, the baby began to show inability to nurse and breathe adequately at the same time. It had some fever. It could not raise its head, nor move its arms at the shoulders, or the legs at the hips or knees. It flexed its forearms feebly, showed complete extensor paralysis at both wrists. Both thumbs were dislocated outward at the interphalangeal joint. It showed double external paralysis of the feet, though the toes and fingers moved freely. Electrical reaction of the muscles retarded, but no R. D. The tendon reflexes were diminished. Death occurred three days after admission. Most of the writer's pathological findings agree with those of other observers but a few are apparently as yet without analogy in the literature. There were changes in the diaphragm; true, neutral fatty infiltration of the muscle; and degenerative changes in the cells of the formatis reticularis and substantia reticularis. The changes in the diaphragm were areas of great irregularity of staining quality where the striæ were faint or apparently lacking in the case of the stains. The impregnation method of Bielschowsky showed some irregularity in the intensity of the striæ; in some places they seemed run together and obscured by some deposit in the fiber. That these irregularites in staining properties have anything to do with the disease, is not proved.

Vaccine Treatment of Whooping-cough.—Thirty-three cases of whooping-cough were treated by E. M. Sill (*Amer. Jour. Dis. Child.*, 1913, v, 379) with pertussis vaccine, and in all the effect of the vaccine was to diminish markedly the number and severity of the paroxysms and the amount of vomiting. No untoward effects, either local or general, from the use of the vaccine were noted. The longest time any of the children coughed was twelve weeks and four days. The longest time any child coughed after it was put under vaccine treatment was nine weeks and one day, the average length of time being four and one-half weeks. The injections were given every two or three days in most of the severe cases, and in the very severe cases every day for a few days, until the symptoms were relieved; the milder cases did not receive the vaccine so often nor so much at a time. In giving the vaccine the writer was guided more by the severity of the disease than by the age of the child. The youngest child treated was one month old and the oldest was six years. Most of the children were from six months to three years of age. The dose of the vaccine varied according to the number and severity of the paroxysms, from 20,000,000 bacteria in the mild cases to 60,000,000 in the severe cases. The cases that were seen early in the attack, before the paroxysms had attained their height, seemed to respond more quickly to treatment and their course was shorter. In all cases, however, after one to three injections, the number and severity of the paroxysms was markedly lessened. The children did better when the vaccine was given in moderately large doses at intervals of one or two days. In a number of severe cases 40,000,000 to 60,000,000 bacteria at each injection were necessary to control the paroxysms and bring relief. The correct dosage for the mild cases is 50,000,000 bacteria given every other day, while in the severe cases this amount should be given every day, or 100,000,000 every other day. The vaccine is given under antiseptic precautions, subcutaneously, with the ordinary glass syringe, the injection being given in the abdomen or buttocks. Immunizing doses of pertussis vaccine were given to children in a family in which one of the children was under treatment for whooping-cough. These children were watched over a period of two months, and although they had never had whooping-cough and were constantly exposed to the disease, did not contract it. It would seem, then, that the vaccine confers immunity to the child injected with small doses. One child of five years was given four injections of 20,000,000 bacteria each, over a period of one month; another in the same family, three years of age, got nine injections of 20,000,000 each, over a period of one month; neither child developed pertussis.

Treatment of Epilepsy.—Albrecht Erlenmeyer (*Berl. klin. Woch.*, May 5, 1913) thinks that the diagnosis of epilepsy should be made not only in individuals who have fully developed seizures, with clonic and tonic spasms, but also in many slighter affections, such as one-sided convulsions, rotatory epilepsy, dizziness, fainting, petit-mal, absence of mind sleepiness, stupidity, sudden anger, night terrors and cries, wetting of the bed, gritting the teeth, reddening of the face, sudden breaking out of sweat, intolerance for alcohol, sudden running, purposeless wandering, and many other slight nervous disturbances. All of these show the underlying epileptic temperament. The author has not much faith in pressure on the brain as a cause of epilepsy and thinks that there are very few persons who can be benefitted by operations to relieve pressure on the brain. Pressure symptoms resulting from hydrocephalus, encephalitis, exudates, cysts, sclerosis, etc., are not causes of true epileptic seizures. Chemical toxins may cause increased intracranial pressure. Such are chronic poisoning with alcohol, cocaine, absinth, nicotine, etc. Epileptic attacks may result from autointoxication by increased internal secretions, and from poisons of infectious diseases. We know that in very early and intrauterine life changes in the brain substance are the cause of epilepsy, and that in grown persons the abuse of alcohol, trauma, syphilis, and arteriosclerosis are responsible for the beginning of attacks. The consideration of the kind of aura that the patient has is most important in diagnosis. This may last from a few seconds to several days. It may be motor, psychical, vasomotor, sensorial, or localizing. The attacks seldom have the same character in the same individual at different times, neither is the aura always the same. The hour at which the attack takes place is most important; whether it occurs with full bladder, empty stomach, headache, etc. The kind and amount of food taken are important; the stools, menstruation, use of alcohol and tobacco, sexual excitation, condition of ventilation, presence of fear, anger, anxiety, etc. Epilepsy is found in the encephalitis of heredosyphilis, alcoholism, and combined with microcephaly, and other deformities. As to the treatment of epilepsy, the author thinks the most important drug is some bromide. But this should be managed according to the character of each special case, not in a routine manner. Chloral hydrate and opium may also be useful. It is most important to control the sleep, and to give entire rest in recent cases that have frequent attacks, putting these patients to bed. Epileptics should never lie on feathers, but on a hard mattress, lest they smother themselves in attacks occurring at night. In chronic cases the day should be divided into intervals of rest and of moderate exertion. Diet should be controlled and all excesses in eating and drinking prevented. A too large vegetable diet will be worse than a mixed diet with moderate meats. A daily action of the bowels is of great value in treatment. Hydrotherapy includes warm sitz baths in congestion of the head. Full baths should always be taken in the presence of another person. Electricity will be of no value. Operations on the skull are seldom of avail, and only after well-authenticated accidents. Operations on the nose and throat are valueless. Strong revulsive methods are to be avoided.

Melena Neonatorum Cured by Injection of Defibrinated Human Blood.—Albert Merckens (*Münch. med. Woch.*, May 6, 1913) has made use successfully of the injection of defibrinated human blood in a case of melena neonatorum. The mortality of this disease, as stated by the older authors, was 50 to 80 per cent. Now, in spite of the use of gelatin, it is 44 per cent. The blood is defibrinated by whipping for fifteen minutes, and twenty to thirty minutes later it is injected. In melena neonatorum the fibrinogen in the blood is normal. The blood of healthy men contains thrombin, which is brought into the blood of the infant and brings about clotting. The defibrinated blood was injected by the author intramuscularly, and was taken from the arm of a healthy adult. Twelve cubic centimeters were injected into the gluteal region of the sick child. The infant, which had had bleeding from the mucous membranes and the intestines, recovered rapidly and entirely. The hemoglobin content of the blood was increased after the treatment.

Anaphylaxis for Milk.—Hans Kleinschmidt (*Monatschr. f. Kinderheil.*, Bd. xi, Nr. 12, 1913) gives his results in the use of milk to cause anaphylaxis in animals. Healthy, young guinea-pigs can be sensibilized to cow's milk by way of the intestines. This is the case whether it be used raw or cooked for a short time. If it be boiled for a quarter of an hour the results will be inconstant. Sensibility is at first only to the albumin, but later it also occurs to the casein. Both may occur at the same time, or separately. There is no shock when the milk is used subcutaneously or by the intestines. Local cellular anaphylactic symptoms are absent, as are anomalies of the temperature, esinophilia, and antianaphylaxis. Animals who have been subjected to hunger, or to the use of podophyllin, are generally refractory to the dose fatal to the heart. The Berkfeld filter removes from raw cow's milk the cause of the reaction. When this milk is used no reaction is obtained. No positive reaction was seen when inactivated milk which had been filtered was used.

Posterior Rhinitis in Infants.—F. Göppert (*Berl. klin. Woch.*, May 19, 1913) states that in most cases coryza and catarrh in infants are of infectious nature. In artificially fed infants such a catarrh has a very bad effect on nutrition, producing indigestion and diarrhea. In the Hospital for Children at Wiesbaden the author observed an epidemic of acute coryza in ten children which spread to all in two weeks. All of them were more or less retarded in recovery from the disease for which they entered the hospital. In a few cases only the anterior nasal space is affected, the mucosa being swollen, and later thickened. The earliest attack of coryza often occurs within a few days of birth, and leaves a thickened mucosa which prevents the infant from breathing through the nose. The child nurses with difficulty and often refuses the breast or bottle. It keeps the mouth open constantly. In other cases the posterior nasal mucosa only is affected, or both may be involved. The thorax remains undeveloped, and the abdomen is long, large, and tympanitic. Acute reinfection occurs constantly and the child gets into a deplorable condition. There may be real hypertrophy of the third tonsil. The obstruction is often at the posterior nares and with growth the condition is cured spontaneously. The use of a solution of adrenalin insufflated before nursing is often of great value to the child in chronic cases. The prevention of acute attacks by good hygiene is important.

Etiology of Scarlet Fever.—Martin Kretschmar (*Monatschr. f. Kinderheil.*, Bd. xii, Nr. 1, 1913) says that in spite of all the research work that has been done by many workers, the etiological factor in scarlet fever is still unknown. Bacteriological examination has shown the presence of the streptococcus in all tissues examined in scarlet fever and its complications; still it is unproven that the streptococcus is the real cause of scarlet fever. It is acknowledged that the streptococcus is the ultimate cause of all the complications. Streptococci are found in all tissues examined from inflamed glands, ear discharges, sinus discharges, and other tissues involved in these complications. The etiological action of the streptococcus as the ultimate factor has not been proven, either by serological methods or by inoculations of animals. The cell inclusions which were at one time supposed to be microorganisms causing scarlet fever have been found in a number of other infectious diseases, such as pneumonia, therefore they cannot be the ultimate etiological factors in scarlatina. Inoculations of animals with filtered and unfiltered scarlet-fever material have in some cases produced a disease similar to scarlet fever, but there is no positive proof that this is true scarlet fever. The author has made inoculations in monkeys, and other animals, but without getting any definite results.

So-called Inclusion Bodies in Scarlet Fever.—A. Gouget (*Presse méd.*, May. 3, 1913) says that twenty years ago inclusions in the leukocytes, supposed to be some sort of microorganism, were described by some authors as the probable cause of scarlet fever. To support this theory there were two facts; the negative one of the impossibility so far of finding the cause of the disease; and the frequency of the presence of a positive Wassermann reaction in scarlet fever. Döhle described thirty cases of scarlet fever in the dry blood specimens from which these leukocyte inclusions were found. Some of them looked like cocci, others were larger, round, oval, or pear-shaped, and having filaments. They stained like the nuclei of the cells. Döhle believed that they were degenerated spirochetes, on account of the filaments, and that they were the cause of scarlet fever. Kretchemer found them present in recent cases of scarlet fever. Nicholl and Williams found them present forty-five times out of fifty cases, the five negative cases being examined later than the sixth day of the disease. They have been found constant in about 500 cases in the period from the third to the tenth day, and would seem to have some diagnostic value. However, the same inclusions have been found in several other infectious diseases, which lowers their diagnostic value in scarlet fever. They are more abundant in cases of severity where the fever is high, and in less numbers or absent in mild cases. They are not found present in the toxic exanthemata. Their absence in the mild cases, where assistance in diagnosis is important, make them of little real diagnostic value in scarlet fever. Their exact nature is unknown. Bongarty thinks them always pathological, and regards them as fragments of the nucleus. What they are is still an open question, but not one of practical interest.

M. Nicoll, Jr. (*Arch. of Ped.*, 1913, xxx, 346) has now examined between 300 and 400 cases of scarlet fever, usually during the first week, with reference to the presence of inclusion bodies. He says that the finding of typical inclusion bodies in a case resembling scarlet fever before the fourth day of the disease may mean scarlet fever, sepsis or severe streptococcal angina. Negative finding practically excludes the existence of scarlet fever. In the course of diphtheria, for which antitoxin has been given, positive findings before the seventh day are not diagnostic of scarlet fever. After this time a positive finding in the case of a scarlatiniform rash should make one suspect very strongly the existence of a complicating scarlet fever. There is at present no short-cut to the diagnosis of scarlet fever. All the clinical symptoms and signs must be taken into consideration in reaching a conclusion, and among them the determination of the presence or absence of inclusion bodies in the blood has a not unimportant place.

Casein-fat Milk as Food in Disease and Health.—P. Heim and M. K. John (*Monatschr. f. Kinderheil*, Bd. xi., Nr. 12, 1913) give the results obtained by them in the use of the so-called casein-fat milk in healthy and in sick infants. They fed forty-five healthy children, beginning between the end of the second week of life and the fourth week, with casein-fat milk and continuing to the end of the seventh month. The children were at the end of that time all in good condition; the color, sleep, appetite, absence of dyspeptic processes, activity, motility, and all the bodily functions remained normal. The skin and mucous membranes were normal, in contrast to the eczematous conditions frequently observed in children fed on cow's milk. The milk is prepared by heating to 40° C. with a coffeespoonful of labessence, causing a complete coagulation. The curd is then thoroughly broken up by stirring, when the cheese is pressed through a fine hair sieve, allowing the whey to run out. The remaining curd is mixed with two-thirds as much warm water and pressed through the seive. An almost homogenous fluid remains. This is placed on the fire to boil for three minutes. Then one-third hot cow's milk is added and 30 grams of Sexlet sugar, and the mixture is put in a cool place. When this milk is given to young healthy children their nourishment is perfect, and when given to dyspeptic children the good effects are very soon apparent. The stools become fewer, consistency and color normal, body weight begins to increase and diuresis is apparent. The number of feedings can be reduced. Increase in weight, and in growth in length, ossification of the bones, and function of the bodily organs are all found to be normal under this feeding. If constipation is caused it can be combated by the use of milk sugar. The effect of this food on dyspepsia is seen in twenty-four hours. The food agrees with very young infants, in whom cows milk causes dyspepsia. The bad effect of cow's milk on the nervous system is done away with.

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ORIGINAL COMMUNICATIONS.

THE NEW YORK OBSTETRICAL SOCIETY AND WHAT IT HAS CONTRIBUTED TO THE PROGRESS OF MEDICINE. THE ANNIVERSARY ADDRESS DELIVERED AT THE FIFTIETH ANNIVERSARY OF THE SOCIETY.

BY

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New York.

Just fifty years ago, on the ninth day of October next in this city a child was born, one that was destined, as we read the history of its vigorous and active development, to exert a great and lasting influence upon the evolution of obstetrics, gynecology and pediatrics. It was christened the New York Obstetrical Society. The birth was free from those agonizing pains that usually attend the consummation of parturition, and was presided over by such able obstetricians as Fordyce Barker, Charles A. Budd, Thomas F. Cock, and Isaac E. Taylor. Abraham Jacobi was also in attendance to see to it that proper infant diet was provided, and the feeding adjusted to the requirements of the new arrival.

How the distinguished obstetricians who have had in charge this celebration of the birth, should have made such a mistake in the date of delivery as to place it February 14 is the unanswered question of the hour. Still, so slight an error as 237 days in a fifty-year gestation, is not to be taken seriously, except by those who have been asked to participate in the exercises, and thereby find the time of preparation cut short to the brief space of a few days.

In this connection your speaker finds it very appropriate, as expressing his position here to-night, to quote one of our Founders—the opening lines of Dr. Thomas F. Cock's introduction to his

Manual of Obstetrics: "This little work now offered to the public makes no professions to originality. It is avowedly a compilation and hence with a few exceptions no authorities are given for the statements which it contains."

We read in the minutes that the first step toward organizing the New York Obstetrical Society were taken in October, 1863, by Dr. T. G. Thomas, who suggested to several obstetricians the possibility of establishing in this city such a society. A call was accordingly issued, and a preliminary meeting held at the house of Dr. Thomas, on October 9, 1863. There were present Drs. Barker, Budd, Cock, Emmet, Jacobi, Noeggerath, Peaslee, Reynolds, Sabine, Swift, Taylor, and Thomas. Drs. Elliot and McLeod, who were included in the call, were not present until the second meeting.

The meeting was organized by calling Dr. Barker to the chair, and the appointment of Dr. Swift as Secretary. A committee to draft a constitution and by-laws was appointed, consisting of Drs. Peaslee, Thomas, and Budd. The second meeting was held October 20, when the Society was regularly organized, and the following officers elected: President, Dr. Cock; Vice President, Dr. Emmet; Recording Secretary, Dr. Swift; Corresponding Secretary, Dr. Jacobi; Treasurer, Dr. McLeod.

The Fellowship of the Society was originally limited to 25 members, but in April, 1866, it was increased to 40. Although it adopted the rather exclusive name of Obstetrical Society, its declared object was "the promotion of knowledge in all that pertains to Obstetrics, Gynecology and Pediatrics."

It is interesting to note that the first scientific work was the consideration of a specimen of a uterus containing a large fibroid tumor, presented by Dr. Emmet.

The Society met in rotation at the homes of its members, and the social feature for the cultivation of good fellowship was made a prominent part of the evening's exercises from the first.

The Founders of the Society were:

Fordyce Barker,
Charles A. Budd,
Thomas F. Cock,
George T. Elliot,
Thomas Addis Emmet,
Abraham Jacobi,
Samuel B. W. McLeod,
Emil Noeggerath,
Edmund R. Peaslee,
James B. Reynolds,
Gustavus Sabine,
Foster Swift,
Isaac E. Taylor,
T. Gaillard Thomas.

These fourteen men were undoubtedly the choice spirits of their time in the medical profession of New York. Did time permit, a brief word picture of physical appearance, mental attainments, and personality, would give to us ideals and lofty inspiration. Truly may it be said there were giants in those days. Of that sturdy band two only have honored us by living to the present day: Thomas Addis Emmet and Abraham Jacobi.

"Behind the panorama of external events and changes, which history unfolds before our view, there lies the hidden world, of desires and motives, of passions and energies, which produce or accompanied them; behind the busy scenes of life lie the inner regions, the under-current of thought." It was my purpose to take up these various lines of thought at their inception and follow them through their various phases of evolution as they are presented in the Transactions of our Society, setting forth in connection therewith the parts the different actors played in the growth of these ideas. But the time at my disposal has permitted me to follow very imperfectly the history of a few of these thoughts.

If it be your pleasure then I will ask you to spend the brief time allotted me in the society of the Founders. We will attend some of their meetings and listen to their deliberations. A few of their immediate successors may also be introduced.

In 1863, when this Society was organized, American obstetrics, gynecology and pediatrics were in what has been classified as the second epoch of development. It is interesting to note the order of foundation of the special societies of this character throughout the world.

Obstetrical Society of Berlin, 1844.
Obstetrical Society of London, 1859.
Obstetrical Society of Boston, 1861.
Obstetrical Society of New York, 1863.
Obstetrical Society of Philadelphia, 1869.
Gynecological Society of Boston, 1869.
Obstetrical and Gynecological Society of St. Louis, 1877.
Obstetrical and Gynecological Society of Baltimore, 1877.

I take it that any scientific society, especially if it be the home society, is entitled to the credit of the individual activities of its members wherever they may be exploited. In following the evolution of an idea, therefore, I have not hesitated to follow our members when giving expression to those ideas even without our walls. The home society is the school in which their thought has been directed and the intellect trained. It is entitled to the fruit or product of that training.

Previous to the organization of this Society the spirit and genius of Marion Sims had been moving on the face of the waters. Living in an obscure way in the town of Montgomery, Alabama, he had devised an operative cure for vesicovaginal fistula, he had founded the Woman's Hospital, where, with the assistance of Thomas Addis Emmet, he developed a school of plastic surgery. On the groundswell of interest and enthusiasm thereby created, the New York Obstetrical Society came into being.

Marion Sims was a genius, and in many respects a unique figure in the surgical world. From another point of view he was a typical product of American soil—a later expression of the spirit of McDowell, the great original ovariotomist.

Marion Sims, because of his residence abroad during the early years of the Society, did not ally himself as an active member till 1869, but his influence throughout his career in stimulating thought and investigation was so great as to demand extended mention in this connection, at this time. His son-in-law, Dr. John A. Wyeth, has written a most sympathetic account of the career of this great man and from this I quote freely.

Born amid the most humble conditions, in a backwoods county of South Carolina, he died the foremost surgeon of his country and of the world. What a transition from the log-cabin of the farmer in Lancaster district to the palace at Saint Cloud, where he was a guest of Napoleon III, the trusted physician to the Empress, as he was to the highest and lowest of those who sought relief at his hands in any part of Europe!

As early as 1847 he wrote his first observations upon "trismus nascentium" and the compression of the brain due to overlapping of the cranial bones. The first child with this trouble, to which he was called, died and, with true scientific instinct, he insisted upon and held a postmortem examination. He found the cranial bones overlapping and making mechanical pressure on the brain, and a clot of blood, due to extravasation between the spinal cord and its membranes. The profession is entirely in accord with his contributions on this important subject.

He reached New York in 1853, where after many viscissitudes of fortune he triumphed at last in founding the Woman's Hospital of the State of New York, an institution which was the center for the dissemination of all that was new and best in gynecology, and which to-day stands as one of the monuments to the memory of its founder.

While residing in London, in 1865, he published his "Clinical Notes on Uterine Surgery." That work was issued simultaneously from the English, German, and French presses, in London, Berlin, and Paris, and its authority was at once recognized by the profession throughout Europe and America. In his Memoir to Dr. Sims, Dr. Thomas Addis Emmet says of it: "Its publication was the turning-point of modern gynecology, or, more strictly speaking, American gynecology, of which he may be justly termed the father."

It is known to you that Dr. Sims performed the operation of cholecystotomy without knowing it had ever been done, and in fact he was only preceded by a few months by one other and he an American, Dr. Bobbs, of Indiana. There can be no doubt but that the establishment of this great operation was due to its advocacy by so distinguished a surgeon, with whom it was original.

Outside of his contribution to the subject of gynecology, probably the most important forecast of the surgery of the future, and one designed to rank higher in professional literature, are his remarks on the treatment of gunshot wounds of the abdomen in relation to modern peritoneal surgery, which were published only a little while before his death, in the British Medical Journal, a synopsis of which was read before the New York Acadamy of Medicine, on October 6, 1881.

It may safely be said that this paper by Marion Sims ("The Careful Aseptic Invasion of the Peritoneal Cavity Not Only for the Arrest of Hemorrhage, the Suture of Intestinal Wounds, and the Cleansing of the Peritoneal Cavity, but for all Intraperitoneal Conditions") was the starting point in this new field of surgery. It is true that other surgeons, many years before this date, had opened the peritoneal cavity and sutured intestinal wounds. But the operation was not accepted until, following the conclusions of Dr. Sims, our distinguished surgeon, Dr. W. T. Bull of New York, in a successful case of intestinal suture for gunshot wound, presented before the New York Surgical Society on January 27, 1885, demonstrated beyond all controversy the value of exploration of the abdominal cavity under such circumstances, and from that date the operation has been frequently and successfully performed.

It has been said that in the death of J. Marion Sims, 1882, the art of gynecology closed the formative period of its history. He was also an originator in the field of abdominal surgery.

Marion Sims was the surgeon-in-chief of the Woman's Hospital, with Dr. Thomas Addis Emmet as his assistant, from its foundation in 1853 till 1861–2, at the outbreak of the Civil War. He then went abroad, leaving Dr. Emmet in charge of the hospital, who was then promoted to surgeon-in-chief. Allied with him in the capacity of consultant surgeon and physicians were Alexander H. Stevens, Edward W. Delafield, John Francis, Horace Green, and later Fordyce Barker, T. Gaillard Thomas, Isaac E. Taylor, and other members of this Society.

I mention this fact to show how intimately the Society was related to the hospital, and how natural it was that it should draw from that source so much of the interesting pathological material that made the early meetings of the Society rich in that field of investigation. It is a marked feature of the minutes of the meetings that few set papers adorned the programs, the time being almost completely concerned in the narration and discussion of cases, and of pathological specimens.

To know the actors in these scenes and feel the force of their efforts to know the truth and enforce it, it may be well to draw a brief picture of their careers.

Dr. Thomas Addis Emmet, as I have recorded, inaugurated the scientific work of the Society by presenting at its first meeting the specimen of a uterus containing a large fibroid polypus, it may be well to project his picture first. As he has lived and labored among us, even down to this present moment, and still retains his interest in the affairs of the profession, and therefore is well known to all of us, I will be brief.

Dr. Emmet has been, and is, a man of indomitable perseverance, untiring industry, endless patience, and a devotion to detail that is destined to bring success wherever it is applied. He had a genius for work, and in this respect he was the complement of his chief, Marion Sims. Sims had the genius to grasp the salient features of a situation, to look into the future, to originate, and to suggest; Emmet was the faithful worker, who accepted, absorbed and applied his ideas. Sims did not have the patience to become a finished operator, while Emmet became the greatest plastic surgeon of his generation. His discovery of the lesion of laceration of the cervix, and the operation which he devised for repair, together with his reconstructive work in repairing the floor of the pelvis, will stand forever as the foundation stones of his enduring fame. The hot vaginal douche, which he suggested and developed to a systematic treatment, has become universal throughout the world.

He was born at Charlottesville, Virginia, 1828, received his medical training in the Jefferson Medical College and served as Resident Physician of the Emigrant Hospital of Philadelphia, but began, prosecuted, and finished his medical and surgical career in New York

Thomas F. Cock was born July 1, 1816. His father was a practic ing physician in New York for nearly sixty years. The subject o our sketch was educated at Haverford College, Penn, graduated from the Medical Department of the University of Pennsylvania in 1840, and settled at once in New York. He promptly drifted into the specialty of obstetrics, held the position of Physician of the New York Hospital; Consulting Physician to the Lying-in Asylum; to the Woman's Hospital; and to the Infirmary for Women. He was Professor of Obstetrics in the New York Medical School, and published a manual of Obstetrics.

Charles Amos Budd was born in New York in 1831. He was the fourth generation of physicians in his family. Educated in the Grammar School of Columbia College, and New York University, taking the degree of A. B. in 1850, and A. M. in 1853, he had the A. M. degree conferred upon him by Trinity College, Hartford. He received his M. D. 1852, Medical Department, New York University. In 1856 visited Europe and studied at the Rotunda Hospital, Dublin, and the Maternité, Paris; 1860 Professor of Obstetrics, New York Medical College; 1863 Professor of Midwifery and Diseases of Women and Children, New York University; also served as physician to Mt. Sinai Hospital; Charity Hospital; and Consulting Physician to the Woman's Hospital and Bellevue.

Isaac E. Taylor, born Philadelphia, 1812, of English parents. Educated Rutgers College; received his M. D. University of Pennsylvania in 1834; began his practice in New York 1839. In 1840 visited Paris and became a student of Prof. Cazaux, studying obstetrics and diseases of women and children; also traveled extensively, visiting the various hospitals of Europe. Was appointed Attending Gynecologist to the Eastern, Northern, and Demilt Dispensaries. 1851 appointed Physician to Bellevue Hospital and immediately commenced his series of improvements and reforms in the government, economy, and service of the public institutions of the city. Through this reorganization he combined under one head Bellevue Hospital, Charity Hospital, Smallpox Hospital, Almshouse, Workhouse, and the Penitentiary. As a part of this renovation Bellevue Hospital Medical College, was established, a prominent feature being the outdoor clinic department. He was rather a prolific writer, his contributions to medical magazines covering the whole range of medicine and surgery.

T. Gaillard Thomas, born 1831, near Charleston, S. C., son of an Episcopal Minister; educated at Charleston College; Medical Degree, Medical College, of the State of South Carolina. Served as interne in Bellevue Hospital; also in the Emigrant Hospital, Ward's Island. This was followed by a year in Paris, and later experience in the Rotunda Hospital, Dublin. Began practice in New York, 1855. Appointed Adjunct Professor of Obstetrics to Dr. Bedford, University Medical College. Visiting Physician Bellevue Hospital, Attending Surgeon Woman's Hospital 1872. Became full Professor succeeding Dr. Bedford, 1865. Appointed Professor of Obstetrics and Diseases of Women and Children, in the College of Physicians and Surgeons. 1879 became Professor of Gynecology.

Dr. Thomas has been called the inspired teacher, whose every word carried conviction. His style was clear and concise, full of sparkle and brilliancy. He was a careful student and studied to present his subject in the clearest and most persuasive language, and also to embellish it with engaging voice and tone. He made his professorship a means of further pupilage for himself and verified the saying that the best learning is gained through teaching. In 1868 appeared his text-book on Diseases of Women. This was the first distinct work on the subject ever published in this country. It was followed rapidly by successive editions, and translated into French, German, Italian, and Chinese. He was a rapid though careful operator, resourceful in difficult situations, always calm even in the presence of the most unexpected complications. His example and his precepts contributed much to the advancement of surgical technic. He excelled especially as a laparotomist. The one distinct contribution that he made to surgery was the operation of laparoelytrotomy. He died in 1903, in his seventy-second year.

His chapter in the first edition of his book on the etiology of uterine diseases is a masterful presentation, setting forth the improprieties of dress, the imprudence during menstruation and after parturition, the revolting and criminal acts in preventing conception, and the induction of abortion; the inconsistencies and follies of present-day social life; the want of fresh air and exercise; the high pressure of the higher education of girls; and the excessive development of the nervous system. Nothing better has ever been done, in this line, as a guide and warning to the growing girl.

Fordyce Barker, born in Maine, 1818; died in New York, 1891, aged seventy-three years. Graduated Bowdoin College. Studied Medicine with Dr. Henry I. Bowditch and Charles H. Stedman. Received his degree M. D., Bowdoin Medical College 1845. Professor of Obstetrics Bowdoin College. Later in the New York Medical College. Obstetrician to Bellevue Hospital 1854, and Professor of Obstetrics and Diseases of Women, Bellevue Hospital Medical College. The latter position he held until his death. His chief contribution to medical literature was The Puerperal Diseases, published in New York, 1874. This rapidly ran through many editions and was translated into French, German, Italian, Spanish, and Russian. His clinical portrayal of these diseases in this volume will probably never be surpassed, though his views of the pathology and therapeutics had been already largely controverted before his death by the phenomenal advances in the germ theory of disease.

Barker was a man of most commanding presence, attractive manners, genial temperament, and fascinating personality. He was always a welcome guest in the best circles of New York society, and a prominent figure in the social life of Europe, to which he made annual trips extending over a period of more than thirty years. He was on terms of intimacy with Dickens, Thackeray and other literary celebrities. In medical matters he was conservative, if not indeed reactionary, and could never be led to accept Holmes' idea of puerperal fever. His social influence in medical societies was always great, and his courteous and conciliatory attitude always made for harmony and good fellowship.

Emil Noeggerath, born 1827, died 1895, at the age of 68 years. Noegerrath may be said to have been the leading man of the Obstetric Society in the study of pathology, with Dr. Jacobi as a second, and Dr. Mathew D. Mann a first assistant. Dr. Mann was for a number of years the official pathologist of the Society.

Noeggerath was a conspicuously good observer and a careful student. He found that chronic or acute nonpuerperal perimetritis followed exposure to wet and cold, protracted exertion, and sometimes a violent shock, physical or mental. "I have seen it follow," he says, "the introduction of the sound by an experienced surgeon, application of a noncauterizing medicine into the uterus in its mildest form, in the shape of a salve; the wearing of an intrauterine pessary; an incision of the os external or discission of the neck; dilatation of the womb by compressed sponge; application of leeches to the neck, and even the bimanual examination of the internal genital organs. It therefore appears that no kind of manipulation of the uterus is not, *under certain circumstances*, liable to start an acute perimetritis. It has impressed itself on the minds of gynecologists sufficiently so that all of us have been trying to find an explanationof the fact and to avoid the danger resulting therefrom. By many they have been, and are now, ascribed to careless after-treatment, to rough and indiscriminate use of the sound, pessaries, knife, etc." "Wherever," says Noeggerath, "I have had occasion to examine postmortem under these circumstances, I have found the existence of salpingitis, and in those cases which could be carefully investigated during life, the history of gonorrhea, either in the patient herself, or in the husband, has rarely been absent. In this way a sufficient and probably the only simple and acceptable explanation has been given."

As a result of these investigations Noeggerath published, in 1872, in Germany, and in the German language, his famous monograph on Latent Gonorrhea. This awakened a terrific protest in Germany, and throughout the world. Noeggerath mildly remarks: "My monograph was not received very favorably by the medical press." In fact the opposition simulated that which met Dr. Holmes' pronunciamento on puerperal fever. Noeggerath however continued his investigations although he was not permitted the honor of discovering the diplococcus gonorrheæ.

Noeggerath was one of the founders of the American Gynecological Society, and at its first meeting in 1876 presented a paper entitled Latent Gonorrhea Especially with Regard to its Influence on Fertility in Women. In this article he foreshadows the discovery of the diplococcus and says that he had for years entertained the hope that the key to solve the question might be found in the presence of a fungus peculiar to the secretions of women affected with latent gonorrhea, of which his researches had given much encouragement. He laid down the following principles: 1. Gonorrhea in the male, as well as in the female, persists for life in certain sections of the organs of generation, notwithstanding its apparent cure in a great many instances. 2. There is a form of gonorrhea which may be called latent gonorrhea in the male, as well as in the female. 3. Latent gonorrhea in the male, as well as in the female, may infect a healthy person either with acute gonorrhea or gleet. 4. Latent gonorrhea in the female, either the consequence of an acute gonorrheal invasion or not, if it pass from the latent into the apparent condition, manifests itself as acute, chronic, recurrent perimetritis, or ovaritis, or as catarrh of certain sections of the genital organs. 5. Latent gonorrhea in becoming apparent in the male does so by attacks of gleet or epididymitis. 6. About 90 per cent. of sterile women are married to husbands who have suffered from gonorrhea either previous to, or during married life.

This condition of things explains: 1. Why so many healthy, blooming, young girls, begin to suffer and fail as soon as they enter the bonds of marriage. 2. Why so many apparently healthy young women remain sterile. 3. Why the patient labor of our physicians is so often thwarted in the attempt to cure certain affections of the female genital organs. It explains to some extent the prevalence of uterine diseases in large cities, and their increase during the last twenty-five years.

Dr. George T. Elliot was one of the most prominent of this brilliant group of men. He stands out as a man of keen intellect, logical thought, and clear presentation. In 1868 he published a book entitled Obstetric Clinic, D. Appleton & Co. He must have been a most impressive teacher, for his presentation of cases is clear, concise, and graphic; his diction superb, and his search for the truth ever present. In the Preface he says: "During a service of fourteen years in Bellevue Hospital, it has been my constant endeavor, by clinical instruction, to make my advantages available for others."

"At the commencement of my services in Bellevue during April and May, 1867, I determined that the most interesting cases should serve as the basis for a volume, in which should be interwoven the substance of such clinical remarks as were then made to the class in attendance, with such other practical hints as might naturally suggest themselves during the preparation of the work."

The cases thus collected represent faithfully the difficulties, anxieties, and disappointments inseparable from the practice of obstetrics, as well as some of the successes for which we are entitled to hope in these arduous and responsible tasks. They illustrate debatable and elective methods of treatment, and therefore contribute to the establishment of laws as yet undecided. They supply a large number of facts in elucidation of the relations of albuminuria to pregnancy, and demonstrate alike the unexpected difficulties and the unexpected ease which may mark the performance of obstetric operations.

This was the period in which the use of anesthetics in obstetrics was under trial and especially the relative merits of chloroform and sulphuric ether. He frankly confesses that, after a debate with Fordyce Barker at the Academy of Medicine, he had become a convert to sulphuric ether. He says I have found ether better borne than chloroform, the latter agent depressing the pulse, which intermitted under its use, while ether produced a stimulated effect. There is no difference in the effect of ether or chloroform upon the labor pains so far as my experience goes. In the same labor I have several times seen these agents equally and successfully produce stoppage of the pains or diminution of their force and the pains improve after each withdrawal. He describes the practice of dilating the cervix by means of warm douches, Barnes' bags, and discission with a knife, etc. The most interesting chapters, however, are devoted to puerperal eclampsia. Interest at that time was centered entirely upon the kidney. The work of Dr. Elliot in these investigations was scientific and exact. In one of his studies he secured 30 specimens from pregnant women in Bellevue hospital and to eliminate all sources of error in the examinations divided them equally between Alonzo Clark, Austin Flint, Jr., and W. H. Draper, ten being sent to each.

At the Lying-in Asylum, Charity Hospital, and other places, he made examination of the urine of 437 pregnant women. In twenty-three of these albumin reaction was produced by the admixture of pus; deducting these he concluded that the presence of albumin occurred in the ratio of one to twenty-two cases. His descriptions of these eclampsia cases are wonderfully clear and graphic, a picture that is never forgotten. He lays great stress upon the importance of prophylaxis and says: "It is evident that it is of vital importance that the urine be examined microscopically, and chemically, during pregnancy, and that no precaution should be omitted which may guard against error. Cases in which repeated examination during the first eight months of pregnancy having disclosed nothing, albuminuria and convulsions may occur subsequently with serious consequences. The difficulties attending prognosis are increased by the facts divulged. They stamp the consideration of the induction of premature labor in these cases with a strong approval. They force us to remember also that however favorable one of these bad cases may have terminated, an individual predisposition to serious renal disease has been begotten and that future pregnancies demand redoubled watchfulness. Primiparæ are more liable to puerperal eclampsia than multiparæ, but it is probable that the danger is greater for multiparæ."

Elliot was a master mind and enlisted in his service every one that came into the sphere of his influence. It is to us somewhat amusing to find him leaving T. Gaillard Thomas holding a postpartum uterus to prevent hemorrhage while he goes home to take his breakfast.

The transactions of the Society from its inception to the present day are an epitomy of the development of the specialty of Gynecology during that period. There is time for a brief mention of but one or two. As has been said, fibroid tumors of the uterus was the first topic for discussion at the first meeting.

We find this subject very common in the early Transactions, but on carefully reading the minutes it becomes apparent that reference is made exclusively to intrauterine fibroids—submucous polypi, and these were a source of great interest and attention. Sir James

Y. Simpson had advocated the importance of gaining access to the interior of the uterus. For this purpose he invented what is known as Simpson's sound, and this gradually lead to the invention and use of the deadly tent, the sponge tent, tupelo tent, and the sea tangle. It is interesting and curious to follow the mental processes of these men in endeavoring to discover the causes of the morbific and deadly effects of the sponge tents. In this field Noeggerath anticipates the principles of heat sterilization by announcing at one of the meetings after a long list of deaths had been reported from the use of tents, that he had discovered that when the sponges were boiled before being compressed, his patients escaped what almost every one had suffered from, viz., parametritis and perimetritis and in many instances death. However tents continued to be used to expose the intrauterine cavity, and ecraseurs and spoon saws were invented to amputate, morcellate, and dig out submucous fibroids. The administration of ergot was employed to force these tumors down to within reach and to control subsequent hemorrhage.

Then began the processes of attacking large fibroid tumors through the abdominal incision, but the disposition of the pedicle became a great problem. No one dared to treat it on the same principle as that employed in disposing of the pedicle in ovariotomy. It was brought up into the wound and made fast there by transfixion pins, by clamps (the famous Simpson abdominal clamp), or by Koeberley's ecraseur. This resulted in frequent postoperative hemorrhages, in nasty sloughing pedicles through which the patient became infected and in the occasional tearing away of the pedicle from the abdominal wall through the strain upon it and slipping back into the abdominal cavity with fatal results. Dr. Stimson, of New York, was first to suggest in these cases the ligation of the uterine arteries in continuity and thereby control postoperative hemorrhage in a simple and effectual way. He did not suggest however dropping the pedicle into the abdominal cavity.

Your present speaker, in operating upon a case of large fibroid tumor in the year 1884, conceived the idea of making anterior and posterior flaps of peritoneum, after the broad ligaments had been ligated and cut down to the waist of the uterus then transfixing the cervix with a strong double ligature and ligating either half in such a way as to include the uterine vessels. Above this the tumor and body of the uterus were cut away (supravaginal hysterectomy) and the peritoneal flaps sewed together over the top of the cervix by a line of suture running across from side to side. The suture was applied in such a way as to securely attach the round ligaments to the cervical stump and cover in the raw edges of the broad ligaments underneath the peritoneal flaps. The pedicle thus constructed was then dropped into the pelvis as in ovariotomy. This was an entirely new departure, and was christened the intraabdominal but extraperitoneal method of disposing of the stump after supravaginal hysterectomy for fibroid tumors.

The method of applying the ligature has been modified by adopting Stimson's plan of ligating the uterine vessels in continuity and with this modification has become the universally accepted method of operating upon uterine fibroids. It may, therefore, be justly credited as an output of this Society. By the adoption of this method, in connection with asepsis, the mortality has been reduced practically to nil.

Cystocele.—The treatment of cystocele has received progressive development in its various phases of evolution within the doors of our Society. Perhaps the crudest and least encouraged suggestion for the treatment of cystocele, comes from Dr. Walter Gillette, in which he announces that a great advance over the pessary has been found by him in ligating the mass like a hemorrhoid and letting it slough off. He thinks the same treatment is applicable to rectocele. I can find no record of any other member of the Society adopting this treatment. Dr. Emmet then began his plastic work which consisted in denuding, of their mucous membrane, certain spaces outlined in the vagina and stitching them together to diminish the caliber of the canal and so increase its supporting power. These spaces took various forms from time to time as he found the previous cases had proved unsuccessful.

Dr. Noeggerath found that in cases of vesicovaginal fistula the tissues as a rule retracted, sometimes to a degree that made it difficult to bring them into view for repair. He was therefore guilty on one occasion as recorded in the minutes, of making the suggestion that an artificial vesicovaginal fistula would be efficient in curing cystocele.

The next advance in the evolution of cystocele operations was the interposition, known as the Watkins-Wertheim-Dührssen operation. Although Watkins was never a member of our Society he received his special training at the Woman's Hospital, and while in New York City came under the influence of the master minds of this Society. Those who feel so disposed may strain a point and claim the glory. More recently this operation has been modified by the suggestion which has been practised by some operators of cutting away the uterosacral ligaments bringing them through the base of the broad ligaments and fastening them to the front of the cervix. This is to give greater support to the uterus which carries the bladder upon its back thereby utilizing the principle that the uterus is supported by its ligaments.

There is another operation for the relief of cystocele which to my mind is based upon true physiological principles, is reconstructive in character and is standing the test of experience.

The Transactions of the Society from its inception to the present day are an epitome of the development of the specialty of gynecology during that time. One of the most conspicuous and interesting evolutions was the study of puerperal fever, and the steady progress toward its elimination.

That we may have a proper perspective it may be well to recall the fact that in 1843 Oliver Wendel Holmes published his essay on the contagiousness of puerperal fever, in which he demonstrated in a manner that should have been convincing to every candid mind, that the source of the fever was a contagion, carried from patient to patient, and house to house, by the doctor, by the nurse, or on the instruments. In 1847 Semmelweiss immortalized his name, but became a martyr, in the cause of truth, by his teachings as to the infectious nature of childbed fever.

The reflection that these statements cast upon the accoucheur as the agent in transmitting the infection caused the profession to take strong opposition to the doctrine. The teachings of Holmes and Semmelweiss passed unheeded. Puerperal fever continued its terrible ravages and, in the effort to find a scapegoat, was attributed to hospitalism, to nosocomial malaria, to epidemic influences, to the grace of God.

The crude condition of obstetric practice and art at the time of the organization of this Society, is set forth in the Manual of Obstetrics published by Prof. Thomas F. Cock, in 1853. Among other things I find the following: "Retracted Nipples—In the absence of a breast pump, fill a quart bottle of hot water, pour it out, and then as soon as it is sufficiently cool apply it to the nipples. Sore Nipples—Treatment—A prepared cow's teat, nipple shields of sheet lead." He ventured into the field of gynecology to suggest the following treatment for vaginitis—"To prevent adhesions, use a cylindrical speculum, rectum bougie or a candle twice a day and persevere a long time."

The puerperal state he says "is one of great susceptibility to morbid impressions, and irritating causes produce exaggerated effects; hence sources of irritation (of which fecal accumulation is one of the most common), occurring during gestation, produce severe effects after parturition. When to this is added the exhaustion of labor, and still more especially that arising from considerable losses of blood, symptoms arise which make the discrimination between irritation and inflammation a matter of much doubt. In both there is chill, heat of skin, abdominal pain with tenderness, furred tongue, headache, and rapid pulse. Still farther is the diagnosis obscured by the effect of loss of blood, for venesection temporarily relieves, but the symptoms soon recur, and with renewed force.

"*Treatment.*—Two plans, antiphlogistic and narcotic. Blundell says, "In less vehement attacks if you bleed within six hours after the chill you will save the patient often, if within twelve not unfrequently, if not until twenty-four hours epidemic cases usually die. Sporadic cases are frequently, perhaps usually curable."

"At the first visit bleed 20 ounces or more, until an effect is produced, give Calomel 40 grains and combine with it, if the visit is late at night, pulv. dover., grains, 5 to 10. Bran poultice over abdomen. If the skin is hot and dry, and mouth unpleasant, order effervescing draughts with excess of soda; if they make the mouth more clammy, and cause the abdomen "to bloat," substitute warm tea or small bits of ice.

"Visit again in three to four hours. Indications are to extinguish abdominal pain, and to open bowels. If pulse is firm, skin hot and dry, and pain has returned, bleed again. If venesection is doubtful use leeches, fifteen to twenty, insinuate under lifted edge of poultice. Give ol. ricin. if stomach will tolerate it, if not, repeated enemata; if ememata produce but little fecal discharge do not repeat. After free evacuation avoid purging. Vaginal injections essential, uterine injections objectionable.

"*Second Method.*—Opium to full narcotism, by sol. sulph., morph., opium., tinc. opii, etc. Begin as soon as pulse begins to rise, or immediately after chill; give sol. morph. 20 drops, repeat it every hour, varying the dose and interval till full narcotism is produced, the evidences of which shall be a semistupid state, contracted pupil, moist skin, and above all slow respiration. I have seen respiration reduced to seven in the minute, in one case to nine in two minutes, and this state maintained for one or two days. The pulse does not diminish with respiration, but when it begins to decrease in frequency, diminish opium. Do not give evacuants, allow the opium to regulate the bowels, unless diarrhea comes on. Such treatment may be continued for days, with ice or iced-water as only nutriment. As disease declines, improved diet succeeded by tonics.

The opium treatment requires assiduous and intelligent watching, and in fact throughout a case of puerperal fever the practitioner must *almost be the nurse also.*

"Typhoid form of puerperal fever is by far the most fatal. Prevails especially in hospitals; is usually endemic, sometimes epidemic, and very extensive; during its prevalence not only puerperal, but even pregnant women are in danger.

1. The hospital at Mayence possesses no clinic for students, and no epidemic has ever been noticed.

2. Routh says, that in one of the Paris hospitals, which is situated near an abattoir, puerperal fever prevails while the wind blows from the abattoir, but is not noticed while it is in the contrary direction.

"Inference from such facts is clearly that the practitioner attending puerperal fever should suspend obstetric practice, that nurses should be interdicted from their occupation, that friends should avoid visits, that students and others should abstain from attending women soon after making autopsies. Immediately washing after an autopsy with sol. chloride of soda, carefully cleansing the nails (which should be kept short), and changing the dress, are indispensable after autopsies or dissections.

"The medical attendant should not make autopsies, and should not attend severe cases of erysipelas. When the disease has appeared, the ward should be immediately vacated, and both medical attendant and nurse changed. The ward should be thoroughly cleansed, ventilated, and whitewashed, and chlorine be freely used; after this, it should remain vacant for a considerable space of time, at least a month. Recently it has been proposed to keep up a sustained heat of at least 150° by means of stoves, for at least two days, as a means of purifying the ward."

This was the situation in 1853. The next advance was to discover and convince the profession that puerperal fever is septicemia. And the third step was the teaching of the profession the methods of *prophylaxis.*

Dr. Wm. M. Polk is on record as saying: "In the spring of 1870 there sprang upon all surgical work a wave of sepsis, which practically engulfed every piece of work that had traumatism as its associate. Sixty cases of confinement a month was then the record of the lying-in service of Bellevue Hospital and as I went on duty May 1, 1870, I found every bed filled with a septic case, and as I advanced into the service, as I shifted to the dead-house those who had been there upon my entrance, I merely put in their places others, stricken as fatally as those whom I had originally found in their places, so that out of sixty cases of confinement which fell to my share during the month, forty-five passed into the dead-house, and of that number only two died of causes other than sepsis."

Dr. Brooks H. Wells has written a thrilling account of the contribution of Dr. Henry J. Garrigues, a member of this Society, made to the elimination of septicemia from obstetric practice. I am indebted to him for the following:

"In 1881 the mortality at the New York Maternity Hospital on Blackwell's Island was thought to be very low, as it was only 2.36 per cent. In 1882 it had risen to 3.25 per cent. In the first nine months of 1883, with 345 deliveries, thirty women died and the serious morbidity was enormous. In September the conditions were at their worst. Ten of the women delivered during the month died, about one in four, and the survivors escaped miserably with their lives.

"At this time (October 1) the rotation of service brought Dr. Henry J. Garrigues again in charge. In the fullness of maturity, energetic, thoughtful, calm, he proved to be the man superior to the emergency. Apalled at the frightful conditions, he had already formulated and at once carried into effect a detailed plan for driving out the pestilence. This plan was original in its detail, showed a broad comprehension of the principles of asepsis, was brilliant in its achievement, and of far-reaching influence on the practice of obstetrics. In brief it was as follows:

"Rapid alternation of wards was secured, so as to allow frequent fumigation with sulphur, followed by scrubbing with soap and water, and by 1 to 1000 bichloride solution. Fresh bedding was furnished at each change. The floors were sprinkled four times daily with the bichloride solution. All visitors were rigorously excluded. Doctors and nurses employed in the maternity were not allowed to enter the other hospital wards or the dead-house. The patient had a bath and clean linen beforehand, and on entry to the delivery-room the abdomen, genital region, buttocks, and thighs were washed with soap and water and then with bichloride solution. The vagina was irrigated with two quarts of the solution from a glass fountain syringe with glass nozzle. The rubber sheet on the delivery bed was frequently renewed and washed before each delivery with 1 to 1000 solution.

"No vaginal examination was allowed except after the hands had been thoroughly scrubbed with soap, hot water, and a stiff brush, and soaked in a hot 1 to 1000 bichloride solution.

"When the head appeared at the vulva a piece of gauze soaked in the bichloride solution was applied and kept there. After the expulsion of the child the genitals were kept covered by a similar compress. The placenta was expressed by Credé's method, so that it might not be necessary to introduce the finger inside the vulva. If it was necessary to introduce the finger to remove the placenta or membrane the vagina was washed out, otherwise not.

"Intrauterine injections were used only when the hand or instruments were introduced into the cavity of the uterus, or after the birth of a macerated child. After the expulsion of the placenta the vulva was covered with a large gauze compress wet with the solution. Before each washing the nurses disinfected their hands as before labor. No vaginal injections were used except in fetid lochia. Every substance brought in contact with the genitals was soaked beforehand in the solution.

"There are some of you who may remember the ridicule or skepticism that greeted the announcement of these measures; there are many more of you who remember how the pestilence gathered its terrors to itself and fled away in a night—and it has never returned.

"On December 21, less than three months later Garrigues, in reporting the result of his work, was able to say: "The effect of the treatment has been wonderful. As if by magic all trouble disappeared. Ninety-seven women have been delivered since its introduction and not only has none of them died, but there has scarce been any disease among them—only three had any rise of temperature. The pavilions are scarcely recognizable. Where we used to have offensive odors, feverish, prostrated, or despairing patients, overworked nurses, and despondent doctors, the air is pure, the patients look well, their temperatures are normal, the nurses are cheerful and the doctors are happy."

"Could there be a greater triumph then this? Was ever a greater lesson taught more quietly? What battle of the greatest general of the world's red fields was ever fraught with consequences more momentous?

"Garrigues, the man who saved and taught us to save the mothers of men, lives to know we know the value of his dead; lives in the pulsing blood of happy wives and mothers, and has an immortality in thousands yet unborn."

In spite of this plain and most convincing object lesson there occurred within a year thereafter, right here in New York, a most alarming epidemic of puerperal sepsis in the practice of Fordyce Barker, who was the accredited accoucheur to the most prominent families of the city. The morbidity was almost universal and the mortality most alarming—the whole community was in a state of alarm and the condition was the subject of daily comment in the public press. At this crisis of affairs Dr. Thomas felt it incumbent upon him to drive home in the minds of the profession the lesson that it taught. Accordingly he entered his name on the program of the Academy of Medicine as the reader of a paper on Puerperal Fever, Its Cause and Treatment. Dr. Barker was President of the Academy and presided at the meeting.

It was a bold step on Dr. Thomas' part, for the attitude he took on the subject was equivalent to a personal charge of responsibility on the part of Dr. Barker for the existing epidemic, and the battle was on. Although there was considerable animus in it, the discussion was conducted on such a high plain of professional and gentlemanly ethics, that it affords rather racy reading. I was fortunate enough to be present throughout, although it consumed three successive meetings of the Academy.

I quote briefly from Dr. Thomas' paper:

"A poisonous element has by some method or other reached the genital tract, as fruitful a field for its activity as a mass of dough is for yeast, and the result is already manifesting itself. Let us suppose that the patient's medical attendant lays the flattering unction to his soul that all this is due to "malaria"; or that he soothes his troubled mind with the hope that it is "milk fever"; or that, recognizing the attack as one of "puerperal septicemia," or "blood-poisoning of child-bed," the first link in that terrible chain called puerperal fever, he relies upon medicines given by the mouth or rectum, what is usually the course shown as the natural one of the affection? Within a week, or thereabouts, for there is no rule as to this point, parenchymatous metritis, lymphangitis, lymphadenitis, phlebitis, cellulitis, or peritonitis will probably develop itself, and what was originally merely a septicemia will merge into one of these affections, and the patient will pass through the perils attendant upon which of these pathological states manifests itself as a consequence of the initial lesion.

"And now comes naturally the question, What is the pathology of that affection styled puerperal fever?

"Whatever be the character of this agent, we know that there are *two, and only two,* methods by which it can reach the parturient tract and exert its baneful influence. First, it may be carried to the vulva and into the vagina through the open orifice of that canal by the atmosphere, in which it floats as an inpalpable substance; and, second, it may be carried to any part of the genital tract by the fingers of doctor or nurse; by towels or cloths laid against the vulva; by sponges used in washing; by instruments used in the delivery of the child, drawing of urine, or injecting the vagina; and from the bed-clothing and body-clothing of the patient which are in immediate contact with the sexual organs."

"To-day, when it is generally agreed among the ablest obstetricians of the world that puerperal fever is the result of a special poison and that prophylaxis against this is, by close attention to very simple details, perfectly practicable, it is the duty of every practitioner to guard his patient against danger by every means in his power. If he accepts the views which this paper adopts, his duty is clear; it is equally incumbent upon him to give his patient the benefit of the doubt if he reject them."

Dr. Barker immediately accepted the challenge thus pointedly presented and announced that at the next meeting of the Academy he would refute the bold assertions made by the reader of the paper.

Accordingly, the Academy was crowded to its full capacity and the evening devoted to a continuation of the discussion, the charm and interest of which I can scarcely foreshadow in the following brief quotations from Dr. Barker's elaborate address:

"During the five years which I have had the honor to occupy this chair I have never before seen a meeting of this Academy so enthralled by the charm of elocution, the fascination of rhetoric, the glow of conviction and the air of one who speaks by authority—an air which can never carry weight unless it has been before fairly and justly earned by good work—as on the evening of Deecmber 6, when the paper was read on "The Prevention and Treatment of Puerperal Fever."

"In view of some past controversies outside of the scientific aims of this body, it seems to me desirable and important that the profession at large should understand that in this hall there can be the strongest antagonism in scientific doctrines and in questions of practice, and the keenest encounters in intellectual gladiatorship, carried on with all the courtesy of the duello, without individual hostility or the interruption of personal friendship.

"I would not 'speak disrespectfully' of puerperal septicemia. I believe it to be one of the most dangerous incidents which may occur to women after child-birth, and I trust that it will not be regarded as indelicate if I allude to the fact that in a work on puerperal diseases, published more than ten years ago, a lecture devoted to the consideration of this subject in all its relations filled thirty-seven pages. With the most anxious desire to correct any errors of opinion, and to accept any new views which progressive science or increased and more accuate clinical observation has demonstrated to be true, I have yet found no reason to make any essential change of the views expressed in that lecture, and I here state my conviction that in private practice, when .there is no epidemic influence, twenty cases of local inflammation, due to such causes, will be met with where one will be found due to septic absorption.

"Can it be true that the process necessary for the birth of the human race is always attended with the development of a deadly poison whose malignant effects must inevitably prevent the spontaneous and kindly healing of such little traumatisms as always result from the process, and that, therefore, it is the duty of the accoucheur to take preventive measures of the character proposed? Does every parturient woman, in performing the function of maternity, like the scorpion, that carries in its tail an agent for suicide, if death is threatened by fire, physiologically generate an equally fatal poison in a corresponding locality, which the obstetrician must guard against by means that are most inconvenient, alarming, and not altogether free from danger?

"The belief of the septicemists that terrible dangers threaten every woman in child-birth is based wholly on theory. Because the maternal system has certain peculiarities differing from its normal condition—because the lochia are a poisonous fluid—and because there is always a certain amount of traumatic lesion in the parturient canal following parturition, every child-bearing woman incurs a most hazardous risk. This is a blunt statement of the argument and its deductions.

"In puerperal fever, as met with in private practice, we have to treat the *consequences* of some form of blood-poisoning. This may or may not be septic poisoning. In private practice, I think it generally due to some occult, possibly atmospheric, epidemic influence; in hospital patients, nosocomial malaria, often associated with septic poisoning."

At the succeeding meeting one month later Dr. Thomas settled the question definitely and for all time in a scathing and convincing argument. The closing paragraphs were as follows:

"*So far as I can gather anything certain from his discursive paper, the pivotal idea of Dr. Barker's attack seems based upon the belief that I regard the lochial discharge as a poisonous fluid, which, by absorption, through abrasions in the genital tract, gives rise to puerperal septicemia.* I need not tell you that no such absurd idea ever obtained foothold in my brain or enunciation from my tongue.

If his idea be this, he has been guilty of very superficial reading of my paper, and should not so easily have concluded that I was affected with idiocy. Look at my essay, which is now in print, and you will see, what you already appreciate must be the fact, that I stated merely that the lochial discharge was a material ready to take on those alterations which are affected by microorganisms of bad character, which, changing its nature, render it poisonous to the abraded tissues.

"How difficult it is in a large body like this to keep a discussion properly directed to the points at issue! The crucial questions, Fellows of the Academy, which are before you to-night are these: 1. Are you to look upon septicemia as a poison due to the development of microorganisms, and are you by every means in your power to guard against the contact of these with the genitalia of the puerperal woman? 2. When the disorder is developed, is it best for you to keep your patient seminarcotized or quininized, while the distended abdomen is covered with stupes of turpentine or poultices, and await the result, as has formerly been done; or for you to seek to counteract the septic process which has invaded the genital tract, by local applications? These are the momentous questions; the other points are nonessential ones, and, although important in some respects, sink into insignificance when compared with them."

Lusk said: "I would say that, in my opinion, surgical fever and puerperal fever are not simply analogous, but are essentially one and the same process."

The practical extinction of puerperal fever is the crowning distinction of the last decade of the nineteenth century. With this thought in mind and the knowledge of what the members of the New York Obstetrical Society have contributed to its accomplishment, I close my address.

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CONTRACTION RING DYSTOCIA.*

BY

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It is the purpose of the writer to consider Bandl's ring in tonic and isolated contraction as a cause of dystocia. The condition is not to be confused with the tonic contraction of the structure occurring in tetanus uteri. The clinical picture of the latter is familiar, its dangers and treatment generally understood, and its occurrence undisputed; but that the structure is ever found in tonic and isolated contraction is both doubted and claimed impossible by certain obstetric authorities. Firmly convinced that such a clinical entity not only exists but that it occurs with relative frequency, the following paragaphs are written in the hope of inspiring increased interest in an important and readily recognized complication of labor.

The literature will not be reviewed. It is not extensive. A careful summary made within three years revealed a record of less than 100 cases. The scarcity of reported cases may be due to infrequency of the condition: it may be due to lack of routine search for obstruction in cases where the commonly considered causes have been eliminated.

Tonic and isolated contraction of the ring must be accepted as an entity if its presence can be demonstrated in the absence of tonic contraction of the upper segment, or body, of the uterus. It must be acknowledged an essential cause of obstruction if, upon its removal, labor terminates or can be made to terminate without further incident. In three cases, reports of which are appended, the foregoing conditions have been satisfied.

What may be termed the mechanism of tonic contraction of the ring is well considered in connection with the physiology of this structure. The functionating contraction ring is a phenomenon of normal labor. It becomes most conspicuous at the heigth of a uterine contraction, when it is an important factor in securing satisfactory retraction of the uterine walls about the irregularly outlined fetal body, and disappears between the pains. It is essentially a feature of the second, or expulsive, stage of labor.

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Let the physiological contraction ring become overactive or irregularly active and it can retard labor. Let its action be continuous and it becomes a definite obstruction. With the ring under the latter circumstances we are concerned.

The transition from excessive retraction to tetanus uteri in cases of marked pelvic deformity, impacted shoulder presentations and the like is readily appreciated; that from moderate retraction, the commonest causes of which are malposition, moderate disproportion, premature rupture of the membranes and the irritating effects of internal manipulations and of oxytoxic agents, to tonic contraction of the ring (representing a single zone of uterine muscle) is as easily understood. But the appearance of the condition in normal presentations, where no disproportion exists and before or soon after rupture of the membranes is not readily to be explained upon the basis of undue retraction unless the latter condition be the result of faulty innervation of the uterine musculature or of irregular stimulation of an orderly nerve supply. In this connection, the fact that tonic contraction of the ring is noted in cases where the pains, often from the onset of labor, have been atypical in frequency or severity, or in the amount of suffering occasioned, seems significant.

The characteristics of the ring in tonic contraction are as follows: it completely surrounds as a circle the interior of the uterine cavity, or stands out as a transverse or oblique crescentic ledge along one or more of the walls as more or less of the circular fibers are involved; its prominence and the ease with which it can naturally or artificially be overcome depend upon the intensity of contraction of the fibers composing it; as far as the uterus is concerned, its location is between the active upper and passive lower segments; its location along the child's body varies with the part of the latter in relation with the ring at the time of the latter's appearance; and, when once set up, its position, both as far as uterus and child are concerned, remains fixed.

It is obvious that the ring will usually be found encircling the child's neck; rarely it will form in advance of the presenting part. With the structure in its fixed position and persisting, labor becomes obstructed. Ordinarily, under such circumstances, tetanus uteri is expected. Why it is not to be looked for here will be apparent when the mechanism of the latter condition is considered. The walls of the upper segment of the uterus in tonic contraction are thickened; those of the lower correspondingly thinned and drawn out; a furrow marks the division between these segments; and more or less of the child's body has been delivered into or beyond the lower segment. These features are the results of retraction and do not begin to appear until the latter condition has become excessive. With the tonically contracted ring in advance of the presenting part or encircling its lower pole, neither does advance of the child occur nor is retraction of the uterus upward over it possible; therefore tetany, the result of excessive retraction, does not appear. On the contrary, in the interval between contractions the walls are thin; even when moderately retracted, they are not thick. If, because of higher location of the ring or of unusual strength to the contractions of the longitudinal fibers, more marked retraction were to occur, the possibility of tetanus uteri would be even more remote, for the ring would be forcibly dilated and obliterated as it was drawn over the child and, as a cause of obstruction, would disappear.

The contractions accompanying the condition are intermittent. In practically all other respects they are atypical. Almost invariably they are unusually "painful." This characteristic is noted not only after obstruction to advance is apparent but also, on occasion, from the onset of labor. The same can be said of the irregularities in the frequency, intensity and the duration of the contractions. The apprehension, rising maternal pulse rate and reflex nausea and vomiting often noted are to be interpreted more as manifestations of the patient's nervous reaction to the unwelcome delay in advance, of which she is aware, than as definite symptoms of the condition causing the obstruction.

The physical signs vary with the position of the ring. Whether or not the structure can be felt as a tender furrow through the lower abdominal wall depends upon its formation in advance of or behind the presenting part and upon the location of the latter above or below the superior strait. When the obstruction is located along the posterior uterine wall only, abdominal palpation will be negative irrespective of its situation along the genital canal. With the head in the mid- or in the lower pelvis and with the ring encircling the neck, the external findings usually are negative; for the structure is on a level with or below the symphysis, and the upper uterine segment is relaxed between the pains and not tender. Upon vaginal examination, its board-like resistance is quite readily felt when the structure is located in front of the presenting part; when behind it, the examining fingers detect the tonically contracted ring only as they are carried well upward and beyond the presenting part. To carry out the latter procedure, considerable relaxation of the soft parts, the result either of manual dilatation or of anesthesia, is required. At the height of a contraction, pressure against the presenting part detects no advance; nor is the not-fully-dilated external os distended as the result of it. In low positions of the ring, dilatation of the external os will proceed slowly if at all after the obstruction has been well set up.

Tonic and isolated contraction of Bandl's ring is to be suspected in cases of second-stage delay when all other causes of obstructed labor can be eliminated, when the uterus is not inert and when pains are in any respect atypical. Under the foregoing conditions, careful external and internal examination rarely fails to reveal the contraction ring as the cause of obstruction.

Labor so obstructed should not be confused with tetanus uteri, where the continuous pain, the thickened and firm upper uterine segment and the presence of one or more other causes of obstruction are characteristic. When the pains are infrequent and not severe, the lack of advance definitely suggests uterine inertia; but in the latter condition, the vaginal findings, as far as the ring is concerned, are negative. Because treatment of the muscular underaction in inertia differs so radically from that of the overaction in contraction ring obstruction, it is imperative that the two conditions be differentiated. Without careful physical examination, the differential diagnosis is difficult if not impossible.

Greater difficulty arises in cases where the tonically contracted ring appears late in labor already prolonged because of premature rupture of the membranes, moderate disproportion, the less serious malpresentations and -positions and the like. Only keen judgment and experience can tell in the given case how much importance should be attached to any one of the irregularities mentioned as the real cause of delay in labor; and even the knowledge that they exist is of less value than the definite information that tonic contraction of the ring does not obtain. But the pains of prolonged labor commonly are not atypical and such attempts at operative delivery as traction by the finger in the groin in breech and by forceps upon the head in vertex presentations are usually successful when timely and correctly made. However, should the presenting part fail to advance as the result of conservative operative efforts, an additional or possibly the essential cause of delay must be sought for and the region of the ring explored for evidence of its tonic contraction. If found, attention first must be directed to its relief.

The spasm of the ring is overcome spontaneously as the overactive muscle relaxes with rest, or artificially as the result of dilating force applied to its interior. In that this force may be applied too suddenly and too energetically lies an essential danger of the condition. Since retraction is not excessive, the possibility of intrauterine asphyxia of the child is not great; it is much less than those of traumatism to the head to which traction may have been applied and of asphyxia from compression of the body and delay in delivery of the after-coming head in breech extraction. The same can be said of the danger of spontaneous rupture of the uterus compared with that arising from untimely and vigorous operative attempts at overcoming the obstruction.

Rest for tonically contracted muscle can be secured by the use of morphia and chloral and by the administration of anesthetics. Because of the tendency of all vaginal and intrauterine manipulations to increase the muscular spasm, it is apparent that attempts at artificial dilatation of the ring should not be made until the simpler methods have been employed and failed and then only as complete, general muscular relaxation has been secured by the use of deep obstetrical or, possibly, surgical anesthesia.

Under these conditions, the manual or digital dilatation of the tonically contracted ring is no more difficult than that of the obliterated but not-fully-dilated cervix; the greater ease with which the former structure can be made to relax compensating for the added difficulty in reaching it because of its higher position. Because of the length of labor and the possibility of its artificial termination, narcotics and anesthetics, in the interests of the child, must be administered with great care.

In view of the danger of recurrence, it is advisable that delivery follow the disappearance of the ring as the cause of obstruction. Because of the usual association of the condition with dystocia from one or more other causes, the termination of labor rarely is spontaneous. The final treatment is that suited to the primary cause of the difficult or prolonged labor. Artificial dilatation of the ring predisposes in no way toward subsequent atony and postpartum hemorrhage.

The employment of hydrostatic dilatation and of gauze packing is not only slow and uncertain but also impossible except in the rare ring-in-front cases. Elective abdominal Cesarean section has been employed with success. The operation seems especially applicable to cases where the ring has formed in advance of the presenting part, but entails greatly increased risk when the patient has been subjected to previous though careful examination and instrumentation.

The reports of three cases which follow illustrate several features of the etiology and symptomatology of this interesting condition.

CASE A.—Age thirty-five, gravida-i, full term; past history and that of her pregnancy negative; pelvic measurements ample; well above average weight but leading a more active life than might be supposed from her size and comfortable circumstances; presentation determined and fetal heart heard at thirtieth week; position not made out.

Onset of labor insidious; until ninth hour patient slept at intervals.

During that hour, pains increased so in frequency and severity and became so "propulsive" that competent nurse urged early presence of physician; cervix 1+, obliterated (*i.e.*, external os dilated 1+ fingers' breadth, internal os obliterated).

At seventeenth hour, contractions frequent, markedly "painful" though inefficient; morphia made possible eight hours of comparative comfort, during this period membranes ruptured spontaneously.

At twenty-fifth hour, pains again frequent and fairly efficient; moderate nausea and vomiting.

At twenty-ninth hour, cervix 2+, obliterated and readily dilatable; noted that head did not distend external os during a contraction as at earlier examinations; patient discouraged and moderately apprehensive; abdominal examination negative; fetal heart 140; maternal pulse 90–100 when lying down; examination under anesthesia and the possibility of operative delivery suggested; since not thought imperative, consent not given.

Pains soon irregular, with intervals of from ten to forty-five minutes and varying markedly in intensity; morphia given without benefit; abdominal examination negative.

Determined either to terminate labor by forceps if condition proved one of secondary inertia or to ascertain cause of obstruction to progress of labor if such existed, patient was placed in lithotomy, catheterized and ether to the obstetrical degree+, given continuously.

At forty-first hour, following procedures carried out:

(1) Manual dilatation of outlet and vagina; positive diagnosis of R. O. P. made.

(2) Digital dilatation of cervix; structure 2+, obliterated, readily dilatable.

(3) Manual rotation of occiput; plenty of room in vagina to grasp and turn head but R. O. P. at once resumed.

(4) Medium forceps; cephalic application of Tucker-McLane instrument; firm, intermittent traction with pains but with no apparent advance; no bony obstruction to progress absolutely determined and further attempt with forceps not made; exploration of vagina and tonic contraction of the ring about neck and shoulders of child discovered; upper uterine segment perfectly relaxed; anesthetic pushed to surgical degree without lessening spasm of ring.

(5) Digital dilatation of ring; with little difficulty two fingers forced through ring and cord felt pulsating feebly at 170; doubtful

prognosis as to living child given; complete dilatation of ring impossible. Believing gradual dilatation of ring by breech extraction safer for mother than its more forcible dilatation by shoulders (as result of traction by forceps on head), even though chances of already feeble child were rendered less favorable thereby, following procedures were determined upon:

(6) Internal podalic version; by increasing its flexion, head easily pushed up through ring; version readily carried out with aid of slight pressure at fundus.

(7) Breech extraction; most difficult; ring grasped chest and shoulders so firmly that finger could not be slipped by to determine whether or not arms were extended; meconium passed five minutes after delivery of breech; hold on shoulders not overcome and same delivered for ten to twelve minutes; delivery of after-coming head simple.

Child could not be revived. It bore no marks of definite injury. Unfortunately measurements and weight were not taken; the child was well nourished and above average size.

Persistent, gentle massage practised during third stage with no more than normal bleeding resulting; placenta delivered in twenty minutes after an easy Credé; prophylactic dose of ergot followed by very scant lochia for three days; puerperium in all other respects negative; cervix and perineum were uninjured.

Case B.—Age thirty, gravida-i, full term; housework; personal and past histories and that of pregnancy negative; slender frame, below average weight and height; pelvic measurements not taken.

"Regular" pains persisted for first twelve hours of labor; then became "severe and practically continuous," but were accompanied by no apparent progress; time of rupture of membranes not known; with purpose of advancing labor, quinine, strychnia and pituitrin (1 c.c. hypodermatically) were administered within three hours but without benefit; nor was any definite effect upon character of pains apparent.

When seen in consultation after twenty-three hours of labor, foregoing history was obtained; physical signs were as follows: presentation breech (frank); position L. S. P. in midpelvis; fetal heart 130 and loud, heard with greater intensity in lower left than in lower right quadrant; contractions recurring every two to three minutes, lasting one minute and "severe"; cervix fully dilated; firm, tonic contraction of Bandl's ring grasping child's body, and extended legs between knees and ankles; uterus retracted though irregularities of fetal outline readily palpable.

Believing contracted ring the cause of obstruction, following treatment carried out:

(1) Digital dilatation of ring; under chloroform to obstetrical degree+, two fingers soon introduced into upper uterine segment; cord felt pulsating at about 70; sufficient dilatation readily secured to allow extended legs to be flexed and drawn down.

(2) Breech extraction; extended arms were anticipated, found and quickly remedied.

(3) Low forceps; readily applied to after-coming head to prevent possible delay in delivery.

Child manifested moderate asphyxia pallida which was readily recovered from; it was well nourished and developed and weighed 9 pounds; third stage of labor terminated in an easy Credé; haste in delivery resulted in an incomplete laceration of the perineum otherwise avoidable; puerperium was uneventful.

Case C.—Age twenty-nine, gravida-i, full term; history negative; well nourished and developed, large frame; pelvic measurements ample.

Pains for first twelve hours of labor were "satisfactory." Membranes then ruptured spontaneously; cervix was fully dilated and diagnosis of face presentation was made. Pains soon increased in frequency, recurring every two or three minutes, their duration was prolonged and they become propulsive. With moderate variations, like contractions continued for eighteen hours. At that time, under anesthesia, an unsuccessful attempt at delivery by forceps was made. Two hours later patient was seen in consultation when physical findings were as follows: presentation face, position L. M. P. in midpelvis; cervix fully dilated; fetal heart not heard; upper uterine segment relaxed between contractions; vaginal exploration revealed presence of tonically contracted ring encircling child's neck.

Recognizing structure mentioned as essential obstruction to progress of labor, since treatment of posterior position of chin by version was rendered impossible because of it, following procedures were carried out:

(1) Digital dilatation of ring; under surgical anesthesia, structure gradually enlarged until occiput could be delivered upward through it.

(2) Internal podalic version; readily accomplished with aid of slight pressure at fundus, cord did not pulsate.

(3) Breech extraction; craniotomy to after-coming head employed as a conservative measure.

Child was well nourished and developed and weighed 8 3/4 pounds; postmortem ecchymosis was moderate; third stage of labor and puerperium were uneventful.

The foregoing are manifestly cases of true contraction ring dystocia for in each of them the ring appeared in tonic contraction in the absence of a like condition of the upper uterine segment; it was the essential obstruction because only by its elimination could labor be made to terminate without further incident. The patient in each case was a primipara of twenty-nine or more years who presented no apparent pelvic deformity. In two of the three there existed additional causes either of prolonged or obstructed labor; *e.g.*, frank breech and face presentation with the chin posterior. In at least two of the cases the membranes did not rupture until labor had progressed beyond twelve hours. The maternal mortality was nil. Two out of three of the children were lost. The child was saved where delivery was accomplished within twenty-four hours after the onset of labor; in the other cases labor was terminated at the ends of forty-four and thirty-six hours respectively. Internal podalic version, performed subsequently to digital dilatation of the ring, was readily carried out in each case.

In connection with Case A, the regression of the presenting part noted at an examination made eight hours after rupture of the membranes is possibly significant of the time of appearance of the obstruction and of its location about the neck—and encroaching upon the shoulders—of the child. The particular location of the ring and the intensity of its contraction without doubt explains the immediate resumption of the R. O. P. after the occiput had been easily rotated anteriorly. Delayed attempt at stretching the ring possibly explains the inability to dilate it fully. The etiology of the dystocia in this case is obscure.

In case B., the breech presentation would seem a more logical predisposing or exciting cause of the contraction ring dystocia than the use of pituitrin, for pains were atypical before administration of the drug and subsequently were influenced in no apparent way by it. That the child, part of whose body has been subjected to prolonged pressure by the tonic ring, is not a good risk is apparent from the fact that the fetal heart rate fell rapidly from 130 to 70 under just enough obstetrical anesthesia to permit of dilatation of the ring sufficient to accomplish a speedy delivery.

Case C. is of especial interest in that, with a definite primary cause of obstructed labor (namely, the L. M. P.), tonic uterus did not develop though labor was not terminated until quite twenty-four hours after the probable onset of its second stage. Nothing so effectively could have prevented the progressive retraction of the uterus over the child's body—and the gradual approach of the tetanic state of the upper uterine segment—as the firmly and tonically contracted ring encircling the child's neck soon after the onset of the second stage of labor. The ineffectual attempt at delivery by forceps undoubtedly aggravated rather than occasioned the obstruction that required relief before labor could be terminated.

CONCLUSIONS.

Tonic and isolated contraction of Bandl's ring is not only a possible but also a not infrequent cause of dystocia.

It is usually associated with and secondary to other causes of prolonged and obstructed labor. The etiology may be obscure.

The dangers to the child are those of intrauterine asphyxia from continued pressure when the condition is unrecognized or allowed to persist indefinitely, and shock and asphyxia from attempts at operative delivery. The fetal mortality is high. The dangers to the mother are those common to all operative obstetrical procedures. The maternal mortality should be low. The dangers of tetanus uteri are remote.

The only positive physical signs are those obtained as a result of careful vaginal and lower uterine segment exploration.

Contraction ring dystocia is to be suspected in cases of second stage delay where all other causes of dystocia have been eliminated or where those that may persist cannot of themselves explain the obstruction, and search for the ring made at once.

Success in treatment depends upon the early recognition of the tonically contracted ring, upon the early disappearance of the structure, and upon the early application of conservative methods of operative delivery.

355 State Street.

ARTERIAL LIGATION, WITH LYMPHATIC BLOCK, IN THE TREATMENT OF ADVANCED CANCER OF THE PELVIC ORGANS—A REPORT OF FIFTY-SIX CASES.*

BY

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(With Tables.)

INTRODUCTORY REMARKS.

No more serious problem in the treatment of malignant disease presents itself to the surgeon than the management of those cases of cancer of the pelvic organs which are commonly placed in the category of the "inoperable, irremovable, and incurable." Unfortunately, a large proportion of patients seek relief when the disease has progressed beyond the Wertheim operation. The presence of enlarged glands in the pelvis renders them, in the opinion of the majority of surgeons, unsuitable cases for this procedure. They are, therefore, consigned to their pitiable fate, with absolutely no hope of cure, and with little prospect of appreciable relief.

I beg to dissent from this opinion, and from this method of dealing with these advanced cases of cancer of the pelvic organs. In the first place, it must be remembered that in many cases enlarged glands are of a purely hyperplastic character, and not cancerous. Lymphatic dissemination through attempt at removal of such glands is not a deterrent factor, and certainly such patients should not be denied the possibility of relief by operation. In the second place, even when there are enlarged cancerous glands in the pelvis, when it is sometimes possible, by arterial ligation, to remove these glands *en masse*, and to proceed to do the Wertheim operation, which seemed absolutely impossible before the abdomen was opened. Furthermore, by lessening the blood supply to the cancerous tissue, and by blocking the avenues of lymphatic absorption, the progress of the disease may be retarded, pressure and other symptoms mitigated, and the danger of death from hemorrhage removed, where removal of the cancer mass is impossible. In addition to this, there is a possibility of correcting other conditions which may be superimposed upon, or which may complicate, the cancer.

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Arterial ligation, with lymphatic block, in my opinion, is always to be considered in advanced cancer of the pelvic organs, before pronouncing the case inoperable. In a previous communication* I outlined briefly the history of arterial ligation, tracing the evolution of the procedure as applied to advanced pelvic cancer. The technic, as I have adapted and amplified it, was given, and a series of twenty-four cases tabulated. Since the publication of that report I have continued to test the method whenever it seemed to be indicated. The present communication is in the nature of a further report, with additional cases.

INDICATIONS.

It is not to be inferred that arterial ligation with lymphatic block is advocated in all cases of advanced cancer which are no longer amenable to the usual surgical methods for the removal of cancer of the pelvic organs. It may be indicated under the following circumstances:

(1) When hemorrhage, which threatens death, cannot be controlled by other measures.

(2) When hemorrhage has been sufficiently severe or frequent to warrant the fear of fatal return at any time.

(3) When hemorrhage is sufficient to cause a constant drain on the patient's vitality.

(4) When the disease is so extensive as to render curettage dangerous because of hemorrhage.

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* Arterial Ligation for Irremovable Cancer of Pelvic Organs—Technic Adapted and Amplified. *Woman's Med. Jour.*, April, 1911.

(5) When there is reason to believe that by controlling, to a certain extent, the progress of the disease, the pain, fetor and discharge may be lessened.

(6) When it is possible, by this means, to relieve various pressure symptoms.

(7) When, in the presence of advanced cancer of the pelvic organs, other conditions which may not be directly due to the cancer call for exploratory laparotomy.

(8) When, in cases seemingly too far advanced for total extirpation with hope of permanent cure, there is yet a possibility that life may be prolonged and suffering relieved, and in some cases radical cure effected. Case 26 is an illustration of this.

(9) When all other measures have failed to give any relief from the symptoms in the given case, when the patient demands that something more be done, and when there is any hope of mitigating suffering or prolonging life.

PURPOSES OF THE OPERATION.

The particular application of arterial ligation under discussion is made only in cases of irremovable cancer, and is not to be confounded with ligation employed solely for the purpose of controlling hemorrhage in removable cancers of the pelvis. The term "starvation ligature" has been applied to the procedure when instituted for the starvation of malignant tissue which cannot be safely removed. To the starvation by the cutting off or reduction of the blood supply to the diseased area has been added thorough and complete lymphatic block, which further adds in checking the ravages of the disease. The essential purposes of the combined procedure are:

(1) *To diminish the blood supply to the area of cancerous involvement* by the ligation of the following vessels, or such of them as the individual case seems to require: (a) internal iliacs; (b) ovarians; (c) sacra media. In this way the malignant process is retarded and the bulk of diseased tissue tends to lessen in size in consequence of the decreased blood supply.

(2) *To shut off the avenues of absorption of cancer cells and toxic material* by removing the lymphatic glands and vessels from the receptaculum chyli to the obturator foramen on both sides. The dissemination of the cancer may thus be checked and cachexia delayed or greatly diminished.

In addition to these, the following subsidiary purposes render the operation advantageous:

(3) *To establish positively whether or not a case of advanced cancer is of the irremovable type*, or whether complications, not of a cancerous nature, render the malignant factor seemingly more serious than it is *per se.*

(4) *To remove ovaries and parovarian tissue*, thus eliminating organs, which in themselves, when diseased, quite apart from the cancer, may give many of the symptoms associated with advanced cancer of the pelvic organs.

(5) *To correct complications*, such as kinking of the intestines, adhesions of an inflammatory or evolutionary origin, which may act as mechanical obstructions, etc.

(6) *To correct, if possible, malposition of the uterus*, should this exist. When the uterus is out of position it may, by pressure, cause the symptoms of cancer to be greatly increased in severity.

(7) *To free the ureters*, from the brim of the true pelvis down to the bladder. Sometimes, because of adhesions, beginning hydronephrosis will be found and relieved by freeing the ureters.

(8) *To render more advantageous the application of adjuvant and palliative measures.* With other conditions corrected, the uterus may be curetted, thermocoagulation, thermoradiotherapy, electrocautery, acetone, etc., may be employed.

TECHNIC.

The steps of the operation may be given categorically, as they apply to the average case:

(1) *Laparotomy.*—The abdomen is opened by an incision made a little to the right or left of the median line, the cut being carried quickly through all the tissues, except the rectus, which is drawn to one side, down to the peritoneum. The abdominal cavity having been opened, the patient is placed in the Trendelenburg position. The intestines are displaced toward the diaphragm, in order to give free access to the pelvis, being dyked off with warm pads.

(2) *Ligation of Ovarian Arteries, with Double Oophorectomy.*—The ovarian arteries are ligated just above the brim of the pelvis, one place being sufficient. Pagenstecher thread or strong silk is used for this purpose. The upper part of the broad ligament close to the uterus, with the Fallopian tube, is tied off as well. The ovary, tube and upper part of the broad ligament, including the parovarian tissue, are exsected.

(3) *Incision of Peritoneum on Posterior Wall of Abdomen.*—This is accomplished by a curved incision extending from one internal iliac

artery to the other, with the convexity upward, and prolonged downward along the top of the broad ligament, already divided in the preceding step of the operation. As a rule this gives free access to all the retroperitoneal structures in the pelvis.

(4) *Ligation of Internal Iliac Arteries.*—The internal iliac artery of each side is ligated in turn. The artery is carefully separated from its vein and ligated in two places. The first ligature is placed just below the bifurcation of the common iliac, and the second is placed half an inch below the first. With a large plain clamp the artery is crushed between the two ligatures.

(5) *Ligation of the Common Iliac Artery.*—One may be forced, unexpectedly, to ligate the common iliac artery. An advanced artheromatous conditions of the vessel, with beginning erosion due to softening of the glands at the bifurcation, may render it necessary to ligate the common iliac just above this point in order to obviate the danger of rupture. This procedure, of course, is to be resorted to only in such unforseen emergencies. In Cases 12 and 24 of my first series the common iliac of the right and left sides, respectively, was ligated just above the bifurcation, with no unfavorable symptoms in either case.

(6) *Ligation of the Uterine Arteries.*—If it can be accomplished without cutting into cancerous tissue, the uterine arteries may be ligated.

(7) *Ligation of the Obturator.*—What has been said with reference to the uterine applies likewise to the obturator.

(8) *Ligation of the Sacra Media.*—If large enough to warrant it the sacra media is next ligated. One ligature is sufficient for this.

(9) *Lymphatic Block.*—Either before or after this ligation operation the glands along the iliacs are removed *en masse*, if possible, from the receptaculum chyli to the obturator foramen. The glands situated within and around the obturator foramen are removed. I have without difficulty removed the glands in this locality, taking them out *en masse* and placing a hot pad over the area. If any of the glands are so softened that there is danger of breaking them and soiling the peritoneum, the operator must choose between the two evils—leaving them to early break down themselves, or taking them out and running the risk of rupturing them, thus soiling the peritoneum. The danger of this contamination is slight if one is careful to pad off the rest of the peritoneum, and to carefully approximate the edges of the peritoneal wound, covering over the raw surfaces.

(10) *Correction of Accompanying Pathological Conditions.*—After completion of the ligation and removal of the lymph structures, all

accompanying pathological conditions are corrected as far as possible and in proper sequence. A great deal more can sometimes be accomplished surgically than seemed possible before opening the abdomen. The uterus may be extirpated in some cases where such a procedure seemed impossible before laparotomy. Volvulus, "kinks" and other abnormal conditions of the intestine, causing obstructive and other symptoms, may be discovered and corrected upon opening the abdomen for purposes of ligation. In many cases the victim of cancer may suffer coincidentally with nonmalignant disease of the ovaries and tubes. Removal of these diseased structures may relieve the symptoms, the patient having cancer but not as yet suffering directly from it. There is no reason why a woman should be handicapped by displacement or disease of the ovaries and tubes just because she is the victim of cancer. She should be relieved if possible of these conditions despite the cancer. The ovaries, therefore, should be removed. This is done for the following reasons: (1) In accordance with Beatson's theory of the presumptive influence of ovarian irritation upon the cancer process. (2) An otherwise normal ovary may be subjected to a degenerative process as a result of pressure irritation by the cancer, or by adhesions later in the course of the disease, giving rise to additional preventable discomfort. (3) By cutting away the upper part of the broad ligament, in the removal of the ovary, a certain amount of collateral circulation is shut off, thus facilitating the lessening of the blood supply to the cancer.

(11) *Closure of the Abdominal Wall.*—The posterior layer or peritoneum is closed, the intestines and omentum are replaced in position, and the anterior layer of peritoneum is brought together with a few simple stitches. The abdominal wall is then closed with through-and-through sutures of silkworm-gut or silk thread, *en masse*, for purposes of expedition.

(12) *Curettage.*—After the abdomen is closed the patient is placed in the lithotomy position and thorough curettage, by the Byrne or other method, may be resorted to when circumstances warrant. With the arteries ligated as above described, the uterus may be curetted to a shell without danger of hemorrhage. Zinc chloride or acetone may be applied to the interior of the uterine cavity, or, if feasible, thermocoagulation may be employed.* Curettage and the

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* Bainbridge: (1) "The de Keating-Hart Method of Fulguration and Thermoradiotherapy," *Medical Record*, July 6 and 20, 1912; (2) "Fulguration and Thermoradiotherapy." *The Jour. of Advanced Therapeutics*, January, 1913.

See also *The International Clinics*, September, 1913, and the *Reference Handbook of Medical Sciences*, September, 1913.

adjuvant measures mentioned may be employed immediately after the ligation operation, or a week or ten days later, by which time the tissues will be much more contracted. I prefer the latter.

SPECIAL POINTS TO BE OBSERVED.

Success or failure in arterial ligation with lymphatic block is dependent upon various factors—the extent of the disease, the patient's general state, and the complicating pathological conditions. Aside from all these, however, success is largely dependent upon certain points of technic which should be borne in mind:

(1) *Adhesions.*—If cancerous adhesions are very extensive, so that it is necessary to break them up in order to reach and ligate the vessels, the operation is contraindicated. Extensive adhesions sometimes result from old inflammation, and may have no relation to the cancer so far as their origin is concerned. Inflammatory adhesions may be safely dealt with and the vessels ligated. It is important, therefore, to differentiate between malignant and nonmalignant adhesions.

(2) *Cicatricial Contractions.*—Cicatricial contractions in the diseased tissue frequently cause pressure upon the ureter, which otherwise may not be involved in the malignant process. In such event the ureter may be stripped up, without breaking the cancerous adhesions, thus relieving the pressure in the neighborhood. If the ureter is directly involved in the cancer this does not apply. Separation of the ureter is accomplished by inserting the finger or an instrument between it and the connective tissue which lies over the cancerous tissue, carefully working the ureter free.

(3) *Occlusion of Ligated Artery.*—The entire success of the operation may be nullified by failure to occlude the vessels ligated. Complete closure is rendered certain by ligating in two places and crushing the artery between the two ligatures.

(4) *Hemostasis.*—Absolute hemostasis is important. Oozing from the veins may be controlled with pads dipped in hot saline solution and left in place on one side while attending to the other.

(5) *Removal of Glands.*—In dealing with suspicious glands situated directly in contact with large blood-vessels, one must be careful to ascertain whether they are softened underneath, while apparently normal on the surface. Failure to note such conditions may lead to rupture of an underlying or contiguous blood-vessel, or to the soiling of the peritoneum by the breaking of such softened glands.

(6) *Injury to Iliac Vein.*—Care must be taken not to injure the internal iliac vein, which lies just to the mesial side and behind the artery. This is the greatest danger of the operation.

CLINICAL APPLICATION.

As previously stated, the operation of arterial ligation with lymphatic block is distinctly a procedure for advanced cancer of the pelvic organs, in which the disease has progressed to such a stage that complete removal is impossible. However, if the method were employed earlier in the course of malignant development better results would doubtless be obtained. Latterly I have had recourse to this procedure earlier than formerly, and in such cases the results have been very satisfactory. When the cancer has become disseminated, especially when it has progressed to the stage characterized by vesicovaginal or rectovaginal fistula, it is too late to hope for very much. In Case 43, however, a patient with vesicovaginal fistula was alive and able to work seven months after operation. The tendency should be toward an earlier rather than a later application of the method.

Cases of advanced cancer in the wards at the New York Skin and Cancer Hospital in which ligation has been employed have been compared with others at the same time in which it has not been resorted to, and it has been found that in the former the patients are far more comfortable, and progress much more satisfactorily than the latter.

CASES.

The appended table completes a series of fifty-six cases in which arterial ligation with lymphatic block has been employed in advanced cancer of the pelvic organs. The first series of twenty-four cases is summarized here, as previously published.* It is to be remembered that the majority have had their death warrant read to them, so to speak, more than once, that they are stupified with sedative drugs, and that they are practically left without hope of relief except that which comes with death.

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* *Op. cit.*

SUMMARY OF RESULTS IN THE FIRST SERIES OF TWENTY-FOUR CASES

Case number	I. Length of life after operation	II. Effect upon symptoms	III. Apparent effect upon growth	IV. Effect upon hemorrhage	Remarks
1	Four years, four months	Improved.	Retarded.	None present	I. Barring three patients who died within four days of the operation, and three who were not seen after discharge from hospital, the length of life varied from seven weeks to four years and four months; eight of this number living eight months and more. II. In twenty cases there was improvement in symptoms. III. Growth was apparently retarded in ten cases; doubtful in nine cases; negative in four cases. IV. Hemorrhage was not present in ten cases; controlled in fourteen cases.
2	Seven weeks	Improved.	Doubtful.	None present	
3	Six months	Improved.	Retarded.	None present	
4	Three days	Negative.	Negative.	Controlled	
5	Seven months	Improved.	Retarded.	None present	
6	Five months	Improved.	Doubtful.	None present	
7	Six months	Improved.	Retarded.	None present	
8	Six months	Improved.	Retarded.	Controlled	
9	Ten months	Improved.	Doubtful.	Controlled (after second operation).	
10	Ten months	Improved.	Retarded.	Controlled	
11	Five months	Improved.	Retarded.	Controlled	
12	Unknown	Improved.	Doubtful.	None present	
13	Two months	Improved.	Doubtful.	Controlled	
14	Ten months	Improved.	Doubtful.	Controlled	
15	Fifteen months	Improved.	Retarded.	Controlled (slight hemorrhage toward last).	
16	Four days	Negative.	Negative.	None present	
17	Eight months	Improved.	Doubtful.	Controlled (considerable hemorrhage one month before death).	
18	Three months	Improved.	Negative.	Controlled	
19	Eleven months	Improved.	Retarded.	Controlled	
20	Eleven months	Improved.	Retarded.	Controlled	
21	Five months	Improved.	Retarded.	Controlled	
22	Four days	Negative.	Negative.	None present	
23	Unknown	Improved.	Doubtful.	Controlled	
24	Unknown	Improved.	Doubtful.	None present	

Note.—Of the above series four patients were traced up to 1911. Of these, No. 1, operated September 26, 1906, was alive and well* March 12, 1911; No. 19, operated March 12, 1910, was alive and well March 12, 1911; No. 20, operated upon March 14, 1910, was alive March 6, 1911, but has died since; No. 21, operated March 14, 1910, was alive and well February 24, 1911. Attempts made in December, 1912, to trace these patients proved futile except in No. 20.

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*Unless otherwise indicated, "well" refers to the condition as reported by the patients. They are kept as nearly as possible ignorant of the real condition, and in many cases so far as they know are "well."

ARTERIAL LIGATION FOR IRREMOVABLE CANCER OF PELVIC ORGANS, WITH LYMPHATIC BLOCK.*

No.	Name	Age	Hospital or private	Diagnosis: 1. Clinical. 2. Microscopic.	Date of operation	Condition found upon laparotomy. Palliative measures other than arterial ligation with lymphatic block	Arteries ligated	Effect upon: 1. Pain. } When present 2. Fetor. } When present 3. Discharge. } When present 4. Hemorrhage. } When present 5. Extension. 6. General condition.	Results	Remarks
25	Mrs. G. H.	34	Private.	1. Carcinoma of uterus. 2. Carcinoma.	Nov. 19, 1910	Carcinoma of uterus; extension to other pelvic organs Panhysterectomy (Wertheim).	Internal iliacs. Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Died, Nov. 2, 1911	General condition improved for months.
26	Mrs. C. S.	56	Private.	1. Carcinoma of uterus. 2. Carcinoma.	Nov. 26, 1910	Extensive cancer of uterus. Enlargement of pelvic glands. Chronic appendicitis. Panhysterectomy (Wertheim); appendectomy.	Internal iliacs. Ovarians. Sacra media.	1. Entirely relieved 2. Checked entirely 3. Checked entirely 4. Controlled. 5. Apparently cured. 6. Markedly improved.	Discharged, Dec. 26, 1910. Living, July 1, 1913.	Complete abatement of symptoms. Has gained 20 pounds in weight. Perfectly well at present time.
27	Miss I. R.	54	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Dec. 7, 1910	Seemingly too advanced for the Wertheim operation. Pelvic glands involved.	Internal iliacs. Ovarians. Uterines.	1. Entirely relieved 2. Entirely checked 3. Entirely checked 4. Completely controlled.	Discharged, Jan. 21, 1911. Living, July 1, 1913.	Amputation of breast and removal of axillary glands three weeks after ligation

					Coincidental cancer of left breast, with enlarged glands in axilla. After ligation and lymphatic block, panhysterectomy (Wertheim).		5. Apparently cured. 6. Markedly improved.		operation. All symptoms abated. Well after two years and a half.
28	Mrs. G. D.	63	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Dec. 10, 1910	Carcinoma of uterus. Sigmoid adherent to broad ligament. After ligation and lymphatic block it was possible to perform the Wertheim operation.	Internal iliacs. Ovarians.	1. Negative. 2. Negative. 3. Negative. 4. Negative except venous oozing. 5. Negative 6. Negative.	Died, Dec. 12, 1910.	Died of pneumonia and nephritis. Cause of death entirely independent of cancer. Condition of abdomen perfectly satisfactory.
29	Mrs. B. I.	32	Skin and Cancer.	1. Carcinoma of pelvic viscera. (recurrent). 2. Carcinoma.	Jan. 16, 1911	Very advanced recurrent carcinoma of pelvic viscera; contraction, causing obstruction of both ureters. By stripping up the ureters beginning hydronephrosis was relieved. Panhysterectomy (Wertheim) previously performed.	Internal iliacs.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled 5. Doubtful. 6. Improved.	Discharged, Feb. 1, 1911. Moved away, not heard from since.	Discharged in very much better condition than when admitted to hospital. Diseased parts very much contracted. Pain in back, over kidneys entirely relieved.

* The technic, including double oophorectomy, was performed as per description unless otherwise specified.

An inventory was taken of the cases July 1, 1913. Patients were traced wherever it was possible, and the conditions found are herewith reported.

ARTERIAL LIGATION FOR IRREMOVABLE CANCER OF PELVIC ORGANS, WITH LYMPHATIC BLOCK.*—*Continued.*

No.	Name	Age	Hospital or private	Diagnosis: 1. Clinical. 2. Microscopic.	Date of operation	Condition found upon laparotomy. Palliative measures other than arterial ligation with lymphatic block	Arteries ligated	Effect upon: 1. Pain. } When present 2. Fetor. } When present 3. Discharge. } When present 4. Hemorrhage. } When present 5. Extension. 6. General condition.	Results	Remarks
30	Mrs. A. K.	68	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Jan. 21, 1911	Carcinoma of cervix and body of uterus. Panhysterectomy (Wertheim).	Internal iliacs. Ovarians.	1. Negative. 2. Lessened. 3. Lessened. 4. Controlled. 5. Negative. 6. Negative.	Died, Jan. 30, 1911.	Considerable shock; died of nephritis and endocarditis. Surgical condition entirely satisfactory.
31	Mrs. A. L.	47	Skin and Cancer.	1. Carcinoma of uterus, ovaries, tubes. 2. Carcinoma.	Mar. 27, 1911	Carcinoma of uterus irremovable. Both ovaries badly cystic.	Internal iliacs. Ovarians. Sacra media.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved until few weeks before death.	Died Nov. 5, 1911.	Considerable hemorrhage before operation; none after operation. Lived seven months and nine days in comparative comfort.
32	Mrs. A. R.	35	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Apr. 3, 1911	Cancer of uterus. Cervix and walls of vagina involved.	Internal iliacs. Ovarians.	1. Lessened. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Discharged, Apr. 27, 1911. Living, May 15, 1912. Lost sight of.	Marked improvement in all symptoms. Living in comparative comfort, when last seen, one year after operation.

33	Mrs. M. F.	45	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Apr. 24, 1911	Extensive carcinoma of pelvic organs with hyperplasia of glands. Both ovaries the seat of noncancerous inflammation evidently causing great deal of pain.	Internal iliacs. Ovarians.	1. Lessened. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Died, Sept. 25, 1911.	Patient was rendered more comfortable after operation, particularly with regard to pain.
34	Mrs. A. F.	61	Skin and Cancer.	1. Carcinoma of pelvic viscera with extension to abdominal viscera. 2. Carcinoma.	Feb. 8, 1912.	Extensive involvement of pelvic organs. Irremovable.	Internal iliacs. Ovarians	1. Negative. 2. Lessened 3. Lessened. 4. Controlled. 5. Negative. 6. Negative.	Died, Feb. 11, 1912.	Died of pneumonia., Too advanced for operation, but patient begged that operation be done as nothing else gave her relief.
35	Mrs. L. F.	54	Skin and Cancer	1. Carcinoma of uterus, ovaries, tubes and broad ligaments. 2. Carcinoma.	Feb. 15, 1912	Irremovable cancer of uterus: large ulcerating mass in pelvis.	Internal iliacs. Ovarians.	1. Controlled. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Died, Jan. 25, 1913.	Patient lived about a year after operation. Died not knowing she had cancer.
36	Mrs. J. P.	54	Skin and Cancer	1. Carcinoma of uterus. 2. Carcinoma.	Apr. 1, 1912.	Irremovable carcinoma of uterus and contiguous structures. Bladder and rectum involved.	Internal iliacs. Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Died, May 24, 1912.	Considerable bladder pain, with almost continuous hemorrhage. Operation imperative on account of hemorrhage.

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* The technic, including double oophorectomy, was performed as per description unless otherwise specified.

An inventory was taken of the cases July 1, 1913. Patients were traced wherever it was possible, and the conditions found are herewith reported.

ARTERIAL LIGATION FOR IRREMOVABLE CANCER OF PELVIC ORGANS, WITH LYMPHATIC BLOCK.*—*Continued.*

No.	Name	Age	Hospital or private	Diagnosis: 1. Clinical. 2. Microscopic.	Date of operation	Condition found upon laparotomy. Palliative measures other than arterial ligation with lymphatic block	Arteries ligated	Effect upon: 1. Pain. 2. Fetor. 3. Discharge. 4. Hemorrhage. (When present) 5. Extension. 6. General condition.	Results	Remarks
37	Mrs. T. K.	44	Skin and Cancer.	1. Carcinoma of pelvic viscera. 2. Carcinoma.	Apr. 15, 1912.	Extensive involvement of pelvic viscera. Carcinoma right groin. Ovaries and appendix badly diseased (noncancerous). Ovaries and appendix removed.	Internal iliacs. Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Died latter part of May, 1913.	Lived in fair condition. Able to be up and about for more than a year.
38	Mrs. B. P.	50	Skin and Cancer.	1. Carcinoma of uterus, cervix, broad ligaments and intestine. 2. Carcinoma.	May 3, 1912.	A large carcinomatous mass involving uterus, cervix, broad ligaments and intestine. Irremovable.	Internal iliacs. Ovarians.	1. Lessened. 2. Lessened. 3. Lessened. 4. None present. 5. Negative. 6. Negative.	Died, May 13, 1912.	Died of pneumonia and nephritis.
39	Mrs. R. G.	51	Skin and Cancer.	1. Carcinoma of uterus.	June 25, 1912.	Irremovable carcinoma of uterus	Internal iliacs. Ovarians.	1. Relieved. 2. Lessened.	Discharged, July 18, 1912.	Living one year after operation.

				2. Carcinoma.		Both ovaries involved in adhesions of inflammatory character.		3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Living, July 1, 1913.	Able, July 1, 1913, to do light housework.
40	Mrs. H. S.	41	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	June 30, 1912.	Extensive involvement of uterus and contiguous structures. Irremovable. Left ovary badly diseased; noncancerous adhesions.	Internal iliacs. Ovarians.	1. Entirely relieved. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Discharged, July 9, 1912. Living, Jan. 1, 1913. Lost sight of.	Discharged in good condition. Living six months after operation, feeling very well. So far as patient knows is free from cancer.
41	Mrs. A. McC.	35	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Nov. 14, 1912.	Extension of carcinoma to broad ligaments. Pelvic glands greatly enlarged. Ovaries and tubes badly diseased (noncancerous).	Internal iliacs. Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. No change.	Died, Feb. 23, 1913.	Confirmed morphine habit before admission. Few weeks before death became insane and was removed to Bellevue Hospital.
42	Mrs. J. B.	38	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Nov. 18, 1912.	Irremovable carcinoma of uterus. Marked obstruction of ascending colon. Obstructions corrected.	Internal iliacs. Ovarians.	1. Entirely relieved. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Discharged, Dec. 16, 1912. Living, July 1, 1913.	Patient better in every way. Hemorrhage ceased. At present doing light housework.

* The technic including double oophorectomy, was performed as per description unless otherwise specified.

An inventory was taken of the cases July 1, 1913. Patients were traced wherever it was possible, and the conditions found are herewith reported.

ARTERIAL LIGATION FOR IRREMOVABLE CANCER OF PELVIC ORGANS, WITH LYMPHATIC BLOCK.*—*Continued.*

No.	Name	Age	Hospital or private	Diagnosis: 1. Clinical. 2. Microscopic.	Date of operation	Condition found upon laparotomy. Palliative measures other than arterial ligation with lymphatic block	Arteries ligated	Effect upon: 1. Pain. 2. Fetor. 3. Discharge. 4. Hemorrhage. } When present 5. Extension. 6. General condition.	Results	Remarks
43	Mrs. D. C.	45	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Nov. 25, 1912.	Advanced cancer of uterus. Metastasis in bladder, broad ligaments, and pelvic lymphatic nodes. Vesicovaginal fistula. Ovaries diseased.	Internal iliacs. Ovarians. Sacra Media.	1. Entirely relieved. 2. Practically controlled. 3. Practically controlled. 4. Controlled 5. Checked. 6. Improved.	Discharged Dec. 25, 1912. Living, July 1, 1913.	General condition excellent; has gained in weight, able to go to work, wearing a support, since leaving hospital. Comfortable excepting for leakage from bladder. Persistent in desire to have urine controlled. Marked cachexia entirely gone.
44	Mrs. S. M.	52	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Dec. 30, 1912.	Irremovable carcinoma of uterus. Adhesions between uterus and sigmoid corrected.	Internal iliacs Ovarians.	1. Mitigated. 2. None present. 3. Lessened. 4. None present. 5. Checked. 6. Improved.	Discharged Jan. 25, 1913. Living, July 1, 1913.	General condition very much improved after operation.

45	Mrs. C. D.	36	Skin and Cancer.	1. Pronouncedly malignant tumor (carcinoma?) in culdesac of Douglas, involving uterus and rectum. 2. Studied by several pathologists; classification to be determined; several tentative opinions.	Jan. 9, 1913.	Tumor filled culdesac of Douglas, involving rectum and cervix. Small intestine adherent to uterus. Intestine freed and raw surfaces turned in. Panhysterectomy, removing an inch and a half of vagina and a small portion of anterior wall of rectum size of silver dollar. Enlarged glands in pelvis removed.	Internal iliacs. Ovarians.	1. Entirely relieved. 2. Entirely relieved. 3. Entirely relieved. 4. None present. 5. Checked, apparently. 6. Greatly improved.	Discharged Feb. 13, 1913. Living, July 1, 1913.	Patient feels "perfectly well," has gained in weight, all symptoms have disappeared, and there are no signs of recurrence.
46	Mrs. A. F.	40	Private	1. Carcinoma of rectum. 2. Character not determined; studied by several pathologists; several tentative opinions given. Malignant adenoma.	Jan. 21, 1912.	Mass size of hen's egg in culdesac of Douglas, involving cervix in front and rectal wall behind. Piece of anterior wall of rectum about two inches square removed. Wertheim operation.	Internal iliacs. Ovarians.	1. Entirely relieved. 2. None present. 3. Checked. 4. Controlled. 5. Checked. 6. Markedly improved.	Living, July 1, 1913.	Perfectly well at the present time.

* The technic, including double oophorectomy, was performed as per description unless othewise specified.

An inventory was taken of the cases July 1, 1913: Patients were traced wherever it was possible, and the conditions found are herewith reported.

ARTERIAL LIGATION FOR IRREMOVABLE CANCER OF PELVIC ORGANS. WITH LYMPHATIC BLOCK.*—*Continued.*

No.	Name	Age	Hospital or private	Diagnosis: 1. Clinical. 2. Microscopic.	Date of operation	Condition found upon laparotomy. Palliative measures other than arterial ligation with lymphatic block	Arteries ligated	Effect upon: 1. Pain. 2. Fetor. 3. Discharge. 4. Hemorrhage. (1–4: When present) 5. Extension. 6. General condition.	Results	Remarks
47	Mrs. F. C.	62	Skin and Cancer.	1. Carcinoma of pelvic viscera. 2. Carcinoma.	Jan. 23, 1913.	Carcinoma of pelvic contents. Uterus irremovable. Ovaries and tubes previously removed.	Internal iliacs.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Unchanged.	Discharged Mar. 22, 1913. Living, July 1, 1913.	Some abatement of symptoms, but general condition about the same.
48	Mrs. G. M. W.	55	Skin and Cancer.	1. Carcinoma of uterus and bladder. 2. Carcinoma.	Feb. 3, 1913.	Carcinoma of uterus base of bladder. Sigmoid, which was attached to cancerous mass below, dissected away, and a piece about 1-1/2 inches in diameter removed.	Internal iliacs. Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Doubtful. 6. Unchanged.	Discharged Mar. 16, 1913. Living, July 1, 1913.	Some abatement of symptoms, but general condition about the same.

49	Mrs. M. D.	52	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Feb. 6, 1913.	Uterus hard and firmly fixed; irremovable.	Internal iliacs. Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Discharged, Mar. 20, 1913. Living, July 1, 1913.	Able to be up and to do light housework.
50	Miss. I. S.	52	Skin and Cancer.	1. Carcinoma of rectum; fibroid of uterus. 2. Carcinoma of rectum; fibroid of uterus.	Feb. 17, 1913.	Extensive carcinoma of rectum; fibroid of uterus. Panhysterectomy. Resection of rectum and sigmoid.	Internal iliacs. Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Living, July 1, 1913.	In Hospital at present time, July 1, 1913. Up and about; gaining slowly. Some incontinence of feces, but no fetor or discharge due to cancer.
51	Mrs. E. McL.	47	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Feb. 20, 1913.	Carcinomatous mass involving vagina, base of bladder and pelvic viscera.	Internal iliacs. Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Discharged, Mar. 10, 1913. Living, July 1, 1913.	Bed ridden before operation; now able to be up and to do light housework.
52	Mrs. E. M.	45	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Feb. 24. 1913.	Irremovable cancer of uterus, adherent to bladder and rectum. Tubes, ovaries and appendix badly diseased, but not with cancer. Removed.	Internal iliacs. Ovarians.	1. Entirely removed. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Discharged, May 29, 1913. Living, July 1, 1913.	"Well" at the present time. Does not know she has cancer.

*The technic, including double oophorectomy, was performed as per description unless otherwise specified.

An inventory was taken of the cases, July 1, 1913: Patients were traced wherever it was possible, and the conditions found are herewith reported.

ARTERIAL LIGATION FOR IRREMOVABLE CANCER OF PELVIC ORGANS, WITH LYMPHATIC BLOCK.*—*Continued.*

No.	Name	Age	Hospital or private	Diagnosis: 1. Clinical. 2. Microscopic.	Date of operation	Condition found upon laparotomy. Palliative measures other than arterial ligation with lymphatic block	Arteries ligated	Effect upon: 1. Pain. 2. Fetor. 3. Discharge. 4. Hemorrhage. (When present) 5. Extension. 6. General condition.	Results	Remarks
53	Mrs. V. B.	45	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Mar. 27, 1913.	Irremovable carcinoma involving vagina, rectum and broad ligaments. Many abdominal adhesions. Almost complete intestinal obstruction.	Internal iliacs. Ovarians.	Negative.	Died, Mar. 30, 1913.	Died of nephritis, uremia, and endocarditis.
54	Mrs. G. S.	55	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Apr. 21, 1913.	Advanced carcinoma of uterus, base of bladder and broad ligaments. Irremovable.	Internal iliacs. Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. Controlled. 5. Checked. 6. Improved.	Discharged, May 22, 1913. Living, July 1, 1913.	Perfectly "well" at present time, so far as patient knows.

55	Mrs. I. C.	56	Skin and Cancer.	1. Carcinoma of uterus. 2. Carcinoma.	Apr. 28, 1913.	Advanced carcinoma of uterus and pelvic glands; cystic ovary; intestinal adhesions; involvement of base of bladder and walls of vagina.	Internal iliacs. Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. None present. 5. Checked. 6. Improved.	Discharged, May 15, 1913. Living, July 1, 1913.	Patient has returned to work, in very much better condition than before operation.
56	Mrs. M. W.	68	Private	1. Carcinoma of uterus. 2. Carcinoma.	May 10, 1913.	Inoperable cancer of uterus; various adhesions ligated and divided. Appendectomy.	Internal iliacs. Ovarians.	1. Mitigated. 2. Lessened. 3. Lessened. 4. None present. 5. Checked. 6. Improved.	Living, July 1, 1913.	Elevation of temperature before operation due to septic absorption. Now very much better.

*The technic, including double oophorectomy, was performed as per description unless otherwise specified.

An inventory was taken of the cases, July 1, 1913: Patients were traced wherever it was possible, and the conditions found are herewith reported.

SUMMARY OF RESULTS.

Case number	Length of life after operation	Effect upon symptoms	Apparent effect upon growth	Effect upon hemorrhage
25	One year	Improved	Retarded.	Controlled.
26	Two years and six months.	Entirely relieved	Retarded	Controlled.
27	Two years	Entirely relieved	Retarded	Controlled.
28	Two days	Negative	Negative	Negative.
29	Five months	Improved	Doubtful	Controlled.
30	Nine days	Doubtful	Negative	Controlled.
31	Seven months.	Improved	Retarded	Controlled.
32	One year	Improved	Retarded	Controlled.
33	Five months	Improved	Retarded	Controlled.
34	Three days	Doubtful	Negative	Controlled.
35	Eleven months	Improved	Retarded	Controlled.
36	Two months	Improved	Retarded.	Controlled.
37	Thirteen months	Improved	Retarded.	Controlled.
38	Ten days	Improved	Negative	None present.
39	One year	Improved	Retarded	Controlled.
40	One year	Improved	Retarded.	Controlled.
41	Two months	Improved	Retarded	Controlled.
42	Seven months	Improved	Retarded.	Controlled.
43	Seven months	Entirely relieved.	Retarded	Controlled.
44	Six months	Improved	Retarded	None present.
45	Six months.	Improved	Retarded	None present.
46	Five months	Entirely relieved	Retarded	Controlled.
47	Five months	Improved	Retarded.	Controlled.
48	Four months	Improved	Doubtful	Controlled.
49	Four months	Improved	Retarded.	Controlled.
50	Four months	Improved	Retarded.	Controlled.
51	Four months	Improved	Retarded	Controlled.
52	Four months	Improved	Retarded.	Controlled.
53	Three days	Negative	Negative	Negative.
54	Two months	Improved	Retarded.	Controlled.
55	Two months	Improved	Retarded.	None present.
56	Six weeks	Improved	Retarded.	None present.

REMARKS.

I. Barring five patients who died within from two to ten days after the operation, the length of life varied from two months to two years and six months. Two lived two years; five lived one year and more.

II. The effect upon the symptoms was negative in two cases; improved in twenty-four; doubtful in two; entirely relieved in four.

III. The growth was apparently retarded in twenty-five cases; doubtful in two; negative in five.

IV. Hemorrhage was controlled in twenty-five cases; negative in two; none present in five. In the the cases in which the result was negative there was slight venous oozing, but no real hemorrhage.

Note.—Of the thirty-two cases comprising the second series twelve died, three were lost sight of, and seventeen were living July 1, 1913.

A CASE OF TOTAL OCCLUSION OF CERVIX AND PARTIAL OBLITERATION OF UTERINE CAVITY AFTER PUERPERAL SEPSIS. RESUME OF THE LITERATURE.*

BY

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Mrs, Blank, age twenty six, married ten years. Menses normal previous to present trouble and general health excellent. First child still-born by difficult forceps delivery nine years ago. Second child a forceps case seven years ago. Third child instrumental delivery four years ago. All the physicians attending attributed her difficult labors to contracted pelvis. No miscarriages.

August 27, 1910, the fourth labor began. Family physician failing to deliver by forceps sent her *in extremis* to Long Island College Hospital where instrumental delivery of a still-born baby was accomplished August 29. Puerperal sepsis and neuritis affecting both legs followed. The sepsis was very severe and she was on the dangerous list frequently for over a month. Treatment of the sepsis consisted of a few intrauterine douches during the first few days, Murphy drip and stimulation as needed. She finally weathered the storm and was discharged Dec. 25, 1910, well, except for some leukorrhea and a slight remnant of the neuritis.

The patient passed out of medical observation for about two years when she came to my out-patient clinic at the Long Island College Hospital. She stated that soon after leaving the hospital she had recovered perfect health except that she had never menstruated. Every four weeks she had the menstrual molimen for a few hours—headache, irritability, vertigo and sensation of weight in the pelvis, but no pelvic pain and never a drop of menstrual blood. These sensations rarely lasted over five hours. She had come to the clinic in the hope that we might help reestablish the natural flow and although she felt very vigorous and healthy she was willing to undergo an operation if necessary for that end.

Examination revealed a slight cystocele and a moderate laceration of the perineum. The cervix was normal size and mobile, but very hard. The site of the external os was replaced by scar tissue. The opening of a sinus was seen on the right side of the cervix which admitted a probe about half an inch. Bimanually, the uterus seemed about normal size, retrocessed but mobile. No adnexal enlargements or tenderness found. The patient was sent to the Long Island College Hospital to the service of Dr. Clarence Hyde for further investigation and treatment.

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On August 15, 1912, the cervix, a mass of dense scar tissue, was split up bilaterally. The little sinus before noted was found to be about 1/2 inch long and with a blind end. Finally Dr. Hyde opened into a cavity in the left side of the fundus approximately an inch long and an inch wide, containing a little mucus but no blood. It was not curetted for fear of removing what little chance of menstruation the patient might have. The cervix was sewn up as found. A hard-rubber stem pessary was put into the uterine cavity emerging through an artificial canal made by Dr. Hyde into the left lateral fornix. Then the abdomen was opened through a low median incision. Uterus was found of about normal size and appearance, A few thin adhesions about the tubes were broken up, and the tubes. which appeared normal, were probed with fine bougies. Both were occluded in their inner thirds. The ovaries appeared normal, the left one containing a Graafian follicle about to rupture. Abdomen closed. Patient made an uneventful recovery and left the hospital in ten days.

About three weeks later she came into my clinic again for observation. The sutures holding the pessary had cut through and pessary had come out and been lost. However I was able to pass a sound into the uterine cavity. The patient was told to come to the clinic every other day for the passage of sounds. Through carelessness she failed to do this and despite our efforts the little canal closed up in about a month. At no time after the operation was there the slightest suggestion of menstrual flow. I have seen the patient at intervals of two to four months and she always appears to be in the same excellent health. The mild molimina continue exactly the same as before the operation.

In thinking over the case I believe that the sepsis was responsible for the entire destruction of endometrium, the partial obliteration of uterine cavity and total occlusion of the cervical canal. It is interesting too that so little damage was done to the tubes and no discoverable harm to the ovaries. It is also noteworthy that the menstrual molimina are so mild and there is absolutely no pelvic pain of any kind.

In 1904 Stenger reported a case of complete obliteration of the uterine cavity and nearly total occlusion of the cervical canal of septic etiology. With this report he published a collection of about fifty cases of cervical and uterine atresia from all causes, and his monograph on the subject is the best to be found. In a search through the literature I collected reports of about fifty more cases. What follows is based on all the cases collected by Stenger and myself.

The more common causes of uterine and cervical occlusion were puerperal sepsis, injudicious use of steam as a uterine hemostatic, excessive curetment, the application of powerful caustics, such as fuming nitric acid and zinc chloride, and scar contractions following obstetric lacerations. Then there were a few cases in which the atresia appeared to be a congenital malformation.

In about one-fifth of all the cases puerperal sepsis was the cause. The case reported by Stolz is typical of this class. His patient had a very difficult labor resulting in craniotomy and manual removal of the placenta; intense puerperal sepsis followed, the patient being in the hospital over six weeks. After recovery there was no return of the menses though the molimina of menstruation, cramps, vertigo, lassitude, etc., were present with monthly regularity. Upon examination no cervical canal could be found, and the uterus was small and mobile.

In a very few cases the history was essentially the same but the sepsis was not as destructive to the uterine mucosa. These patients had occluded cervices but the molimina were much more severe because of retention of menstrual blood in the uterine cavity. It was the violence of the uterine cramps, together with the steady enlargement of the uterus that led these patients to consult their physicians. In those few in which the attending surgeon opened the occluded cervical canal the hematometra drained and normal menstrual epochs became reestablished.

In the early experimental days of the use of steam for controlling uterine hemorrhage, Pincus, Dührssen, Czempin, Weiss and several others reported cases of partial and complete obliteration of the uterine and cervical canals. Destructive results ceased after their technic was perfected and especially after they found that thirty seconds of atmokausis should be the maximum.

The application of caustics to cervical erosions usually caused a less severe type of occlusion and most of these cases ended happily after the canal was reestablished. Edis reported three cases of closure of the external os (but not of the canal) after applications of fuming nitric acid. Wiglesworth saw three similar cases, in one of which he notes that no pregnancy followed the successful restoration of the cervical canal. Richardson applied strong nitric acid to uterine and cervical canals in a case of stubborn hemorrhage. He got complete occlusion of the cervix with hematometra and severe molimina menstrualis. After three months he performed a trachelorrhaphy and inserted a Sims glass tube. The next menstrual epoch was perfectly normal and the cure proved permanent. Ballinger reported a case in which he made vigorous applications of a silver nitrate stick to a cervical ulcer and closure of the external os resulted. After the accumulation of a considerable hematometra spontaneous rupture of the stricture occurred. Chadwick was forced to do a trachelorrhaphy on a case that had been too severely cauterized for erosion. Dumouly reported a case that came to him in labor. He found a cartilaginous cervix with no os and was obliged to make radial incisions and deliver by forceps. The actual cautery previously had been applied to an erosion of her cervix. Campioni and Routier each had a case of total obliteration of the uterine cavity after intrauterine applications of chloride of zinc. However, results as severe as these are very rare.

Cicatricial contractions following severe obstetric lacerations were responsible for about a dozen cases, among the more disastrous of which were the cases of Battey and Rendu. Battey's patient had had a very difficult previous labor with such extensive lacerations that, after healing, the uterine and cervical canals and the vagina were obliterated. Rendu's case had had a complete laceration of the perineum from rapid forceps extraction during eclampsia. The vagina and cervix completely closed. The uterus was explored by laparotomy and found to have a small cavity without any retained menses. In most of the cases where scar contractures caused an atresia of the cervix the condition was easily remedied by some slight plastic operation.

Excessive curetment was responsible for only a very few cases. Siedlecki, Fritsch and Veit saw cases in which the uterine cavity was absolutely obliterated by ardent curettage. The patients reported by Kustner and Wertheim were only slightly less unfortunate as they had but a remnant of the former cavity.

Pozzi, Wyder, Braun and others, described cases upon whom amputation of the cervix had been performed (probably with defective technic) with resultant atresia. Most of these cases presented hematometra and hematosalpinx and were cured by puncture and dilatation of the stenosis.

The cases of congenital occlusion of the cervix to be found in the literature are not nearly as common as those of occlusion of the vagina. In most of the cases recorded the stricture was membranous and the condition readily cured by trocar or knife puncture. These cases were commonly discovered at puberty by menstrual molimina with enlarging uteri and amenorrhea. A. H. Ferguson reported a case of six years' duration in which there was an enormous hematometra and large double hematosalpinx. Garrison's case had a very large collection of retained menstrual blood and Downes relieved a uterus of three quarts of old blood by puncturing the cervical obstruction with a hot iron.

Gardner reported a case of a woman who had worn the old cup-stem-belt combination pessary two years without removing the vaginal portion. The cup had produced a sharp flexion of the cervix upon itself. Amenorrhea and an enormous hematometra resulted, cured by hysterectomy.

Perhaps the most interesting of all were the cases reported by Veit, Baldy, Hirst, Kahrs and others in which the etiology had baffled the writers.

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354 OCEAN AVENUE.

SOME GYNECOLOGICAL DISORDERS DEPENDENT UPON GENERAL RATHER THAN LOCAL CAUSES.*

BY

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It is hard for a gynecologist to refrain from writing a paper of more interest to himself than to his audience, and to remember that he is speaking to a body of men doing a general rather than a gynecological practice. As this is a medical society and not a gynecological society or section I was moved to take up some points of common interest rather than some dealing more intimately with special features of my own class of work.

Medical gynecology has been rather neglected in our medical schools and by our specialists, and consequently its development has been left largely in the hands of general men, without special training. It is most important that the specialist have a broad, general training, and that his horizon be not limited. Woe be to the gynecologist who never lifts his eyes above the pelvis, or whose vision is limited by the diaphragm. While I believe it is advisable, if possible, for a man to limit his work to some branch for which he is especially fitted, and in which he is particularly interested, he should constantly be on the lookout for general conditions which may even remotely have some influence upon the work he has chosen. There is no set of organs in the body so bound up in an endless chain of influential factors arising from general metabolic processes as the generative organs. And we would expect this of them since they were destined to perform the highest bodily function.

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*Read before the Medical Association of the State of Georgia, Savannah, Ga., April, 1913.

A study of physiology clearly shows us how intimate the association is between certain of the ductless glands and the pelvic organs. Clinical observation teaches us how dependent the menstrual function is upon general body metabolism, and recent research work by Blair Bell of Liverpool, Burnam of Baltimore and others have added considerable and valuable evidence. And so let us approach our cases with our eyes wide open, willing and anxious to learn everything about out patient befcre blaming her condition upon some more or less innocent pelvic lesion. So many of our gynecological failures, and sad to say there are many, are due to the fact that we have neglected a thorough and comprehensive history and examination, and have blamed some slight laceration or relaxation with some coexisting symptom, where in reality the symptcm antedated the suspected condition, and had nothing whatever to do with it. "Post hoc, ergo propter hoc" reasoning is just as fatal in medicine and surgery as it is in logic. For example, I have seen a slight cervical and perineal laceration blamed for a neurasthenic and psychasthenic condition which had existed before puberty. Of course an operation did no good, why should it? Floating kidneys are being suspended without relief where there is a general splanchnoptosis. Why should we expect anything else when the remaining viscera are equally at fault. These illustrations are sufficient to show the necessity of having a broad and unbiased point of view.

Now it is obviously impossible to even mention all the general bodily derangements which might give rise to gynecological symptoms and so let us take up the commoner ones and go into their etiology. The principal functions of the female pelvic organs being menstruation and reproduction, let us look into some of their abnormalities due to general rather than local causes. In a paper read before the State Association in April and published in the *Journal of the Medical Association of Georgia* for October, the subject of menstruation normal and abnormal was dealt with. The conclusions of which I quote:

1. Menstruation is in general not a local phenomenon.

2. It is dependent upon a good state of bodily health, activity of the ductless glands, and normal pelvic organs.

3. Any derangement of these necessary factors if sufficiently severe may give rise to menstrual abnormalities.

4. In a large majority of menstrual disorders no demonstrable pelvic lesion can be found.

5. In the treatment of many forms we may give relief by the use of calcium salts and the various glandular extracts after securing a good state of general bodily health.

We shall interest ourselves only in those cases having sound and normal pelvic organs, or those abnormal by reason of some general or metabolic cause.

Let us at the onset emphasize the value of prophylaxis, and even before puberty prepare the young girl to take on the new and important functions coincident with that epoch in her life.

Let her be surrounded by good influences physically, mentally and morally. Let her be spared unnecessary demands upon her bodily strength and nervous stability. Let her be taught the meaning of the new life upon which she is entering so that she may be prepared to observe the proper hygiene. If this is conscientiously and carefully done there would be fewer gynecological "explosions" at puberty, and fewer derangements lasting perhaps throughout the menstrual life.

Delayed puberty is rarely due to purely local causes, and usually yields to a change from unfavorable surroundings and proper ministrations to the metabolic needs, by applying the needed calcium or iron as the case may be, or making up deficiencies in internal secretions of the ovary, thyroid or pituitary gland.

The commoner menstrual disturbances which may be due to general causes are:

1. Amenorrhea.
2. Menorrhagia.
3. Dysmenorrhea.

Amenorrhea may be primary, that is, congenital or developmental, or secondary, that is, acquired.

As instances of primary amenorrhea may be cited. (1) Cases in which it is associated with a general arrest of bodily development. Here there probably is a deficiency in the ductless glands not at present well understood and consequently rather discouraging to treat.

(2) Congenital or early acquired pituitary disease. Pituitrin is

used for these cases if inoperable but they are still in the experimental stage.

(3) *Hypothyroidism.*—These cases are very satisfactory to treat if thyroid therapy is begun before a condition of uterine and ovarian infantilism is established.

Secondary amenorrhea may be due to:

(1) *Blood Disease.*—Primary or secondary anemia: chlorosis, an instance of the first, is quite common and yields quite readily to iron therapy.

(2) *Nervous Disturbances.*—There must be a very intimate connection between the nervous system and the functional acitvity of the sexual glands. Insanity, shock, fear or desire for pregnancy may readily cause amenorrhea.

(3) Change of occupation, climate or environment. We are all familiar with cases of young women going away from home to enter school or business who fail to menstruate until they are acclimated.

(4) Acute or chronic disorders. "Cold" following exposure or getting wet, for example. Here hot sitz baths, hot applications to the abdomen and hot drinks are of value, combined with some antispasmodic or vasodilator such as atropine or spirits of nitrous ether. Chronic debilitating diseases such as tuberculosis, pellagra, etc., acquired deficiencies in the ductless glands as mentioned under primary amenorrhea. In these cases it may be necessary in addition to supplying the lacking gland substance also to give some element whose metabolism has been upset by this deficiency, for example, calcium. Or it may suffice to merely supply the calcium, as in a case of mine seen recently. In this young woman, twenty-one years of age, 30 grains of calcium lactate a day for five days relieved an amenorrhea of twenty months' duration.

Burnam reports satisfactory results from the use of luteum extract given in doses of 5 to 30 grains daily, in cases where there was ovarian deficiency.

(5) Amenorrhea due to drug habit, morphine habitues being the commonest seen.

The physiological amenorrhea of pregnancy, lactation and menopause must always be kept in mind, the first especially. The patient's character, social position, etc., should never lead us to overlook this possibility, though of course until we are in a position to prove our claim, the suspicion should be actually "kept in mind."

Menorrhagia may be due to (1) *blood diseases* such as hemophilia, purpura hemorrhagica or scurvy.

(2) *Acute and chronic diseases,* although usually associated with

amenorrhea, may be responsible for menorrhagia. It is not at all unusual in tuberculosis to see excessive menstrual flow. In cases of general debility with a loss of muscular tone throughout the body, the uterus may also be involved and a prolonged flow result. In addition to general upbuilding treatment, calcium lactate is of great value in these cases. Mr. Blair Bell explains this apparently paradoxical use of calcium in this way. He claims that "menstruation is a periodic function only in so far as the calcium metabolism is in harmony with this periodicity, and that the function is dependent upon calcium metabolism in all its ramifications, consequently it is sometimes necessary to supply calcium salts in order to allow sufficient for excertion and the production of menstruation. But in many cases of menorrhagia, while the organism is able to excrete sufficient to start menstruation, which is associated with a great fall in the blood calcium content, it cannot supply enough to the blood to stop that function. For the cessation depends upon a reaction on the part of the organism, whereby calcium salts are accumulated once more in the blood, raising the tone of the blood-vessels and the uterus, and possibly, increasing the coagulability of the blood. I might say Mr. Bell has done some very convincing experimental work and enough clinical application to convince us of the justice of his claims.

(3) *Cardiac disease* sometimes causes excessive menstruation as does Bright's disease.

(4) *Nervous disorders* as mentioned under amenorrhea may likewise cause menorrhagia. Especially the results of sexual excess or excitement. Engaged girls who during that blissful season may be excited without gratification are frequently troubled with menorrhagia. These temporary forms are well treated by cotarnin or "Stypticin," grains 1/2 to 4 t.i.d.

(5) *Hyperthyroidism.*—Here the treatment is that of the exciting cause. Rest in bed, "Wier Mitchell rest cure," calcium lactate, or maybe in some cases partial thyroidectomy.

(6) *Hyperlactation*, sometimes seen in women who have nursed an infant for one to two years. Here weaning the child, building up the mother with food and rest and calcium lactate to replace the prolonged drain of the salt will work wonders.

Dysmenorrhœa.—Many of the causes mentioned under the two previous headings may be responsible for painful menstruation, and we must in all cases coming under our care bear this in mind. Now our physiological studies have clearly shown us that menstruation is not a local phenomenon, but a more or less local manifestation of a general metabolic process, consequently we expect to find many menstrual abnormalities due to general metabolic derangements, and of no type is this more true than in dysmenorrhea. Fully 75 per cent. of these sufferers have no demonstrable pelvic lesions. Most of them are young unmarried women, and most of them can be relieved by attacking causes outside of the pelvis. Even those having an infantile type of pelvic organs, who are temporarily relieved by dilation and curettage, may be cured by proper attention to the metabolic processes which give rise to this infantilism when it is not of too long duration.

To summarize:

1. Many gynecological disorders are but symptoms of some general or metabolic disturbance.

2. The ductless glands, having a strong influence upon body metabolism, are frequent factors in menstrual abnormalities.

3. Calcium salts and glandular extracts are a valubale addition to our therapeutic armamentarium.

Free use has been made of the writings of W. Blair Bell of Liverpool, quotations from his text-book and several articles have been made with grateful acknowledgement.

811-812-813 GEORGIA LIFE BUILDING.

PROLONGED AMENORRHEA WITH BILATERAL OVARIAN DERMOID CYSTS.*

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GENERALLY speaking we expect either no change at all in the menstrual flow of patients with ovarian cysts, or if there is any change that it be in the nature of an increase, a menorrhagia or even a metrorrhagia. It is quite unusual to find amenorrhea as a symptom. It therefore becomes important from a diagnostic point of view to emphasize the fact that ovarian cysts may give rise to amenorrhea. The history of the case I wish to report is, in brief, as follows:

Mrs. Lena R. presented herself at the Out-patient Department of the Mount Sinai Hospital in October, 1912; patient had been married six years and was twenty-five years of age. She had one child five years ago. Menstruation began at seventeen, the periods occurring irregularly at intervals from four to eight weeks, and lasting two to three days. The last period was five years ago. For four years she had had "bearing down" pains in the back and left side; these occurred at intervals of from two weeks to two months. At the time of the pains there were increased frequency of urination and some dysuria. Bowels markedly constipated. General health not much impaired.

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* Reported before the New York Obstetrical Society, May 13, 1913.

Examination showed a young woman in good condition. Physical signs were negative except for the pelvic findings. There was no evidence of anemia. Bimanual pelvic palpation showed the uterus anteverted and of normal size; to either side of the uterus were fluctuating cystic masses about the size of grape-fruit. Urethral and cervical smears for gonococci were negative. The diagnosis of bilateral ovarian cysts was made, and from the consistency of the masses they were thought to be probably dermoids.

The patient was referred to the service of Dr. Florian Krug, and there a bilateral salpingo-oophorectomy was performed by Dr. Krug. Both ovaries were found to be the seat of dermoid cysts containing hair and cheesy material. Macroscopically there was no normal ovarian stroma visible. The patient made an uneventful recovery and the whole interest of the case centers in the amenorrhea.

According to Schaefer, "Benign ovarian tumors, even when they are bilateral and have obtained enormous size, almost never cause amenorrhea; often indeed no menstrual disorder whatever. This is proof of the fact that despite the destruction of the greater part of the parenchyma, there still remains a functionating piece of ovarian substance."

"Malignant bilateral ovarian tumors also do not have a constant effect upon menstruation."

Pfannenstiel states that "at times regular menstruation is still maintained when both ovaries have been converted into tumors and microscopic examination can no longer discover any remains of functionating ovarian substance. I have found this condition in several pure surface papillomata. On the other hand, experience teaches that just those ovarian tumors in which the follicles are destroyed comparatively early, the sarcomata and carcinomata, also the papillary cystadenomata, are accompanied by early cessation of menstruation when they are bilateral. All in all, complete amenorrhea with ovarian tumors is rare (about 2 to 3 per cent.)."

A. Martin found amenorrhea eleven times in 581 cases; Lippert nineteen times in 635 cases.

Nowhere could I find any reference to this symptom occurring especially with dermoid cysts. In order to gain some idea of the frequency with which it is encountered in the operative material of this city I have investigated the last consecutive 100 cases of ovarian cyst operated on the second gynecological service of

Mount Sinai Hospital. No cases of "cystic ovary," microcystic degeneration, lutein cysts or retention cysts were included, only cases of actual tumor formation. It was of course necessary to exclude all patients who were pregnant or lactating, or who had reached such an age that they might be considered to have passed the menopause; also children who had not yet reached the age of puberty.

Of these 100 cases, eighty-six were unilateral and fourteen bilateral; nineteen of the cases were dermoids; in only the above case were the dermoids bilateral, and this was the only instance in which amenorrhea occurred as a symptom. However, this is by no means intended to infer that all bilateral dermoids have amenorrhea as a symptom.

Aside from the purely academic interest, this question has an important practical bearing upon the subject of diagnosis. Given a case which presents a history of several months amenorrhea, unilateral pain, and with a somewhat doughy mass to be felt to one side of the uterus, the diagnosis of ectopic gestation might readily be made. One would, to be sure, expect to have some external bleeding with an ectopic of several months standing; but such need by no means necessarily be the case. At any rate a knowledge of the fact that ovarian dermoids may give rise to amenorrhea will lead to the more careful and repeated consideration of the exact character and consistency of the mass, and a diagnostic error be in this manner avoided.

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67 WEST EIGHTY-NINTH STREET.

THE TREATMENT OF ANTEFLEXION, DEFECTIVE FUNCTION, AND STERILITY BY GLASS OR SILVER STEMS.

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(With Twelve Illustrations.)

Summary.—The well-grounded prejudice against all intrauterine machinery falls away with three relatively recent developments or combinations. The stems are:

1. Uterine in location—not uterovaginal.
2. They are made without gutter, ledge, tube, joint, or other lodgment for secretion.
3. They are retained by simple means.

The principle of choice amongst intrauterine devices is this: for quick action of short duration, the springs (Chambers or Outerbridge), serve to bring on a menstrual period and are adapted to office use; but for long continued effectiveness smooth stems are worn within the uterus comfortably and safely for months to correct flexion, infantilism, stenosis, and painful, sluggish, or absent menstrual function.

The large glass stem of Baldwin is held by a single heavy silver wire stitch passed through its single opening and anteroposteriorly through each lip of the cervix, as high as feasible. It is placed under anesthesia, usually after curetting. The curved, hollow silver stems of Dickinson, designed to be retained by their conical taper and cervical button, are used in office practice.

These effect whatever the various cutting operations effect more simply and safely, without substituting one deformity for another, and with a somewhat higher percentage of cure of sterility and dysmenorrhea.

The first man to devise an intrauterine support was Möller who, in 1803, constructed a stem composed of an elastic catheter with a flexible wire stylet. Amussat followed in 1826 with a smooth ivory stem, and Velpeau, Simpson, and others almost simultaneously revived the idea in 1850. The instrument known as the intrauterine or stem pessary unquestionably counteracted all flexions of the uterus directly and immediately; but, as it was then used, it was found that in a number of cases peritonitis and death followed, so that for a while the method was almost entirely abandoned. Nevertheless, the idea was not wholly rejected and at a medical convention held at Innsbruck in 1869, Spaeth of Vienna and Hugenberger of St. Petersburg expressed their belief in the utility of stem pessaries in cases of anteflexion, and their faith in the comparative safety of the method. Professor Olshausen, then of Halle, published a series of his cases. In 297 cases of versions and flexions, eighty-one were treated by the stem and five others were so treated for conditions other than displacements. Of sixty-six cases which did well there were fifteen in which improvement was permanent; in eleven cases sterility was cured. The stems were worn from periods of a few weeks to twenty-two and one half months.

It is interesting to note that the technic of inserting the pessary consisted in anesthetizing the patient, dilating the cervix, and inserting the stem which was held in place by a vaginal pessary. The patient was then put to bed with an ice bag on the abdomen which remained there for twenty-four hours. A week in bed was considered necessary. The stem was removed at each menstrual period (1). This was strenuous treatment to be carried out each month, and as pelvic inflammation often resulted, or, if latent, was aroused to virulence, or infection was carried in when the stem was inserted, the procedure was not often adopted.

Indeed, the reason of the failure of the stem pessary treatment in former years was that it was then principally used to correct displacements of the uterus often occasioned by pelvic inflammation, or coincident with it, so that trouble ensued. We now know that cases accompanied by inflammation should be rigidly excluded.

The more modern view of the fitness and utility of the stem has been summarized by Carstens (2 and 3) In the cases where menstruation is scanty, occurs at long intervals, or is altogether absent the uterus and ovaries are small and poorly developed. When this condition is found in a young girl the uterus is called infantile; in older women it is spoken of as premature atrophy or premature menopause; and when the condition occurs after childbirth it is called superinvolution. When used in such cases the presence of the stem in the cervical canal irritates the uterus and causes it to contract in the effort to expel the foreign body. By these contractions the uterine muscle develops. The uterus is stimulated and congested, the nutrition of all the pelvic organs is increased, and the uterus and ovaries grow and develop.

Indications.—The functions of the intrauterine stem are:

1. The development of the infantile uterus or ovaries or both.

2. The redevelopment of the uterus and ovaries of premature menopause, obesity, etc.

3. The development of the congenitally defective muscle in the uterine wall at the flexing angle.

4. The straightening of the angle of extreme flexion.

5. The widening and enlargement of the narrowed internal os, giving better drainage.

6. The enlargement of the external os.

7. The relief of amenorrhea due to chronic sclerosis—premature menopause—obesity, etc.

8. The empirical relief of dysmenorrhea. (Notice that several of these indications overlap.)

9. The cure of sterility—in cases in which the vaginal secretions are normal in reaction, in which gonorrheal infection and all pelvic inflammation has been excluded and the husband's semen contains abundant, active spermatozoa of normal size and shape.

Contraindications.—The greatest precaution must be used in excluding cases of inflammation of the tubes and ovaries, and pelvic inflammations in general, either of acute or chronic nature. The gonorrheal complement test may be used in excluding infections due to the diplococcus of Neisser. Latent cases of tubal or ovarian abscess may be lighted up by the introduction of a stem and serious consequences follow. In sterility cases the stem should not be used until spermatozoa have been found to be normal in all respects.

Conditions Adapted to Stem Treatment.—Anteflexion is usually infantilism and can only be improved by developing the uterus at its weak point. For these cases as well as for stenosis of the cervix the Dudley operation is often recommended. But we believe that the main seat of the trouble is at the internal os (Fig. I) and not at the external, and that the Dudley operation is a defective remedial measure as it does not keep the internal os open permanently or develop the flabby flexing angle, whereas the stem does. The Reynolds operation is adapted to short anterior vaginal walls; namely, to those of 1 1/2 inches. This operation will lengthen the wall to 2 1/2 inches but it sometimes results in a sensitive depressed scar and should, therefore, be used only with fully developed indications.

Amenorrhea is frequently associated with obesity. In such cases the uterus and ovaries may be small and under-developed (5). These patients may become sterile and exhibit a variety of nervous symptoms. Medicine does not seem to help very much, but the introduction of a stem pessary and proper control of the diet may result in real benefit.

Dysmenorrhea may incapacitate a woman several days of each month. In these cases all congenital abnormalities, diseases of the tubes, ovaries, and pelvic inflammations of any kind must be eliminated before stem treatment can be considered. When the symptom is due to anteflexion and stenosis of the cervix, treatment by a long intrauterine stem, if kept in long enough, will bring about a permanent good result in over 75 per cent. of the cases.

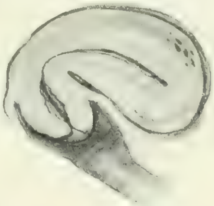

FIG. 1.—Anteflexion of the uterus showing narrowed canal at the internal os with atrophy of the isthmus.

Carstens(3) has drawn attention to another class of cases helped by the stem. There are women who have had normal menstruation for 10 or 15 years and then begin to have pain which increases each month until the periods are severe. Unmarried women who have had to work for a living are most often affected. The cervix is small, hard, and atrophic. The fundus may not be changed or it may be a little smaller than usual. The stem seems to check the process and restore the cervix to a more normal condition.

Norris (11) has recently published the results of a series of 35 cases treated for dysmenorrhea and sterility. He claims 87 1/2 per cent. cure of dysmenorrhea, and 37 1/2 per cent. cure of sterility.

Operative Methods.—There are several operative methods employed to relieve conditions like the foregoing.

Discission—whether the simple form of Sims or the more finished form of Dudley—cures stenosis of the external os, helps endotrachelitis, measurably straightens the canal, but leaves the internal os and the undeveloped isthmus (Fig. 1) not properly cared for except in so far as the single dilatation or section at the internal os brings about temporary relief.

The results which we have had occasion to observe after the Dudley operation, done by ourselves and others, have presented some deformities. The types are pictured in the accompanying illustrations drawn directly from cases (Fig. 2). A slit in no way differing from the old discission or backward section of Sims is the most common. Erosion has been seen twice. Laceration into the posterior vaginal wall with ectropion, as depicted, occurred once at labor and presented no easy problem at a delivery two years later as compared with a lateral or anterior laceration.

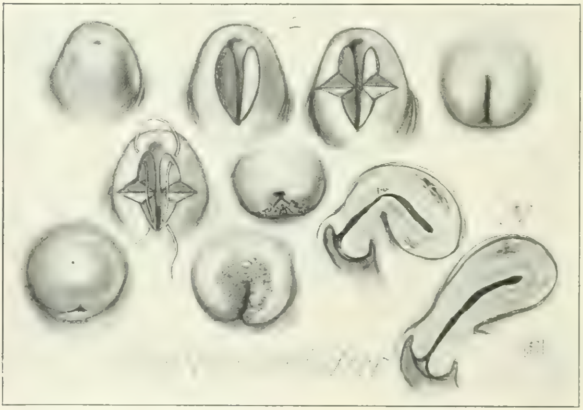

Fig. 2.—The Dudley operation and its results. To the left, above, the conical pointed cervix seen through the bivalve with the patient on her back; the incision; the wedges removed. Second line—the first stitch placed; all the stitches placed. To the left, below, a good result with the external os displaced close to the cervico-vaginal junction, as shown in the section bearing the letters *I* and *O* at the internal os. To the right, above, a not infrequent clinical result which is equivalent to the discission of Sims. In the center, below, the erosion that sometimes results from exposure of the cervical mucous membrane to vaginal secretions. *N* is intended to contrast the normal, and the result of successful stem treatment, with the diagram above it which shows a well-drained, favorably placed, external os, but the narrowed internal os, the flexion, and the atrophy that the Dudley operation often leaves behind it.

As to the Pozzi (6) or Fenwick-Pozzi (9) operation (Fig. 3), our experience has been that the resultant deformity in no wise differs from the ordinary bilateral laceration following delivery. The lips evert, become raw and granular, and sometimes cystic. The operation may relieve sterility and dysmenorrhea, but it substitutes one deformity for another, and eventually calls for further operative remedy. Moreover, it does not pretend to correct the narrowing of the internal os. Physiologically it is defective in that it brings

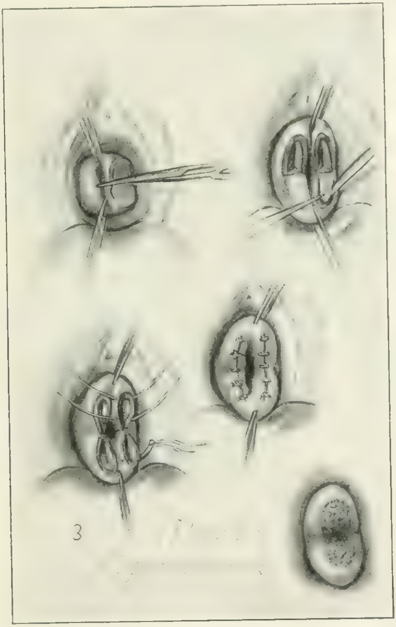

Fig. 3.—The Pozzi operation for anteflexion and stenosis with a clinical example of the erosion and appearance of bilateral laceration which may result.

a mucous membrane, which is intended to be bathed by an alkaline secretion, into constant contact with the acid vaginal discharge; lastly, it makes no provision for developing the atrophic angle. The main objection to the Pozzi operation, however, is that it calls for considerable surgery to correct a condition which may be corrected by as simple a remedy as the intrauterine stem. Pozzi reports the standard percentage of cures; namely, more than 25 per cent. (6).

DESCRIPTION OF STEMS.

1. The Baldwin glass stem is a straight, solid piece of glass, slightly flattened at the cervical end, in which there is a hole for a retaining stitch (Fig. 10). The stems vary in size from 4 1/2 to 6 cm. in length, and 8 to 10 mm. in diameter. When in place the stem is entirely hidden within the cervix. These were first used by Baldwin in 1892.

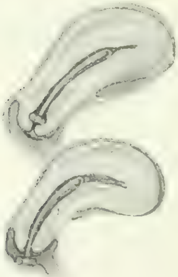

Fig. 4.

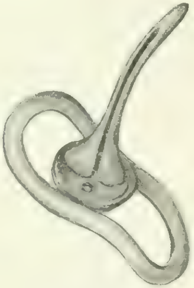

Fig. 5.

Fig. 4.—The silver stem hidden within the uterus. It is usually retained by its conical taper holding above the internal os, *I*. Occasionally it slips downward as far as the posterior vaginal wall and rests upon it. The dilating effected still continues at the internal os, *I*.

Fig. 5.—The drainage tube of Wylie, together with a pessary such as is commonly used to hold other forms of stem in place.

2. The Dickinson hollow silver stem is of hammered silver made over a model. It has a slight curve and is somewhat larger at the uterine end. It is designed to remain entirely within the cervical canal. There is a knob at the outer end to prevent it from slipping out. It is 4 to 5 cm. in length and 5 to 6 mm. in diameter (Fig. 4).

3. The Wylie drains or stems are all made with a "gutter" and have a wide flare on the cervical end. They are straight or slightly curved and are made of hard rubber or aluminum. In length they are 5 to 7 cm. and 5 to 8 mm. in diameter (Fig. 5).

4. The Davenport stem is of hard rubber either straight or curved and has a button in the vagina. It is 5 to 7 cm. long and 6 to 9 mm. in diameter. It is stitched into the cervix. Davenport finds difficulty in its retention.

5. The Robinson stem is of hard rubber or glass. The uterine end of the stem is olive-shaped and the cervical end is fastened to a cup-shaped button. It is always 3 1/2 cm. long. The diameter of the olive portion varies from 7 to 9 mm.

6. The Davis stem is of hard rubber, straight, with a slanting head at the cervical end. It is 5 cm. long and is 6 to 8 mm. in diameter.

7. Gallant's bivalve drain is of hard rubber, hollow, with openings at the sides and has a button on the cervical end. It is 5 1/2 cm. long and 9 to 10 mm. in diameter.

8. Gordon's stem is of hollow steel either straight or curved with a button on the vaginal end. It is gold plated. It is 6 cm. long and 6 mm. in diameter.

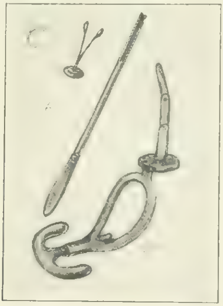

FIG. 6.—The Chambers spring and its applicator. It stays in place well, but its sharp edges are prone to cut into the tissues, and it has a space which may retain secretions. 6*A*, An example of one of the numerous stem devices which serve to discredit the intrauterine stem—namely, the Moseman. It has joints within the uterus which may easily become foul, and a clumsy device within the vagina connecting with the stem in the uterus.

9. Watkins drain resembles a silver double tracheotomy tube inverted.

Springs.—The Outerbridge is made of spring steel wire, silver plated. It is of three sizes: 4, 3 1/2, 3 1/4 cm. long and 5 to 7 mm. in diameter. In order to place this stem it is necessary to use his introducer. The cervical end remains outside the cervix.

The Chambers (Fig. 6) spring is made of hard rubber, either straight or curved, with a button or ring on the cervical end. The uterine end of the stem is olive-shaped. The stem is split in two equal portions down to the button. An introducer is necessary in order to place it within the cervix. It is 5 cm. long and the olive portion is 5 to 8 mm. in diameter. The ring base is outside the external os.

The Southgate-Lee stem is the same size and style as the Chambers but it is made of spring steel and covered with hard rubber. Carstens (4) has used this style of stem. In one case he used this type silver plated.

The special function of the spring type is the immediate induction of menstruation, and its use is limited to short periods of time. Being relatively narrow-edged the spring buries in the mucous membrane, in some cases causing a narrow line of slough or bleeding. This is often aseptic, and for the short time it is employed it may be disregarded because of the benefit obtained and because the spreading top makes the device self-sustaining. Carstens (4) uses a Chambers stem and leaves it in from four to six months. He does not mention the possibility of this type of stem becoming buried.

In Skene's Diseases of Women (10) there are two cases mentioned in which small stems were used for a considerable length of time. In one case the button on the cervical end became buried in the mucous membrane, and in the other, the uterine end of the stem became buried in the posterior wall of the fundus.

The special function of the thick stem pessary is development and permanent dilatation. If without gutters to collect clotted blood and mucus, and if hidden within the external os it may remain in place indefinitely and without any consciousness whatever on the part of the patient.

Among gynecologists, the generally expressed fear and the almost general prejudice against the uterine stem have had a natural and reasonable basis. The old instrument catalogues show a large variety of intrauterine stems. Most of them have more or less complicated devices in the way of pessaries within the vagina to hold the stem in the uterus; for example Moseman's hard rubber pessary (Fig. 6A). Our objection to such devices rests on the strongest possible ground; which is that they are mechanically incorrect, and this holds true whatever the form of joint may be which is supposed to give free play between the uterine and vaginal portions because of pull in the vagina. Also from the point of view of asepsis and chemistry, the connection between an acid vaginal canal which is not to be considered sterile (especially in married women) and the alkaline uterine canal, which is practically closed and away from infection, is fundamental and most important.

Another reason for trouble with the intrauterine stem has been that its material was of such a character that its use was not safe. Hard rubber pessaries, if left in place for weeks, will produce a foul discharge (4). Only two materials may be considered impervious. One is glass of absolute polish, for even the hole in the cervical end of the glass stem is made while it is hot, so that it is a smooth and not a ground edge; and the other is polished silver. Dickinson found that a solid silver stem was too heavy and consequently designed the hollow silver device which he has been using since January, 1910.

The third, and by far the most important reason for the disrepute into which the use of stems has fallen is the one to which we have made several references, but which cannot be said too often. This is the improper choice of cases.

Intrauterine Stems.—As far as our study of precedents goes the following claim seems justified as applied to the Baldwin and Dickinson stems. There is a fundamental distinction to be made between the stems that are truly intrauterine, like these two, and all others. This distinction has to do with mechanical principles and with surgical asepsis.

First as to the mechanics. All the others are uterovaginal stems. None except these are hidden entirely within the uterus. Only these stems are free of leverage on the vaginal walls. Any stem whatever projecting from the external os cannot but be pried in one direction or another—chiefly downward and forward toward the vulva—by the posterior vaginal wall, or by the impact of the fecal column. The stem lying wholly within the uterine canal plays freely with the uterus.

Our studies have been occupied largely with methods of retaining the stem wholly within that canal by anteroposterior location, and by larger size of wire and also by various holding devices, such as the shot suggested by Cary and the silver button of Pomeroy.

The second mechanical question has to do with size. A relatively large size—the largest possible—is used to prevent the burying of the stem in the uterine wall. Fifty-five millimeters is a minimum diameter and 95 mm. is a desirable size. A serious objection to all springs is that their narrow edges cut and bury. The larger stems cannot do this. Hence, as stated above, the distinction between all forms of springs and these large stems is fundamental.

The third mechanical principle is drainage without gutter or slot. This also is fundamental from the point of view of asepsis. A gutter retains clotted blood and dried mucous secretion. This does not happen on the polished surfaces of glass or silver.

As to the prolonged aseptic retention of the intrauterine stem there is much difference between the safety and sterility of those that protrude through the external os and those that do not. In married women there are contacts with any form of protruding stem. In women who use the douche there is such contact and possibility of infection. No douche is needed with an intrauterine stem and there is no handicap to intercourse.

Dilatation.—In the matter of dilatation before placing the stem, whether in the office or in the operating room, attention should be drawn to the theory of parallel blade dilators and the way it falls down in practice. The Goodell-Ellinger type exhibits blades which spread apart when not in action. But when an attempt is made to spread the handles, while resistance is applied to the blades within an inch of the tips, the blades converge toward a point. Not only is there a strong tendency to slip out, but the handles and the scale give no clue to what extent actual stretching of the internal os is taking place. The spreading dilators of the Palmer type, out of the body, show a spread of the tips which would indicate a dangerous tendency to produce laceration within the canal. But in practice the spring of the metal in the blade brings it about that the blades are actually parallel when they are at work. Another strong objection to the Goodell-Ellinger design for office dilatation is that the bulk of the mechanism effectually blocks a view of the cervix, whereas the slender Palmer dilator permits a good view of the amount of penetration of the blade and its spread.

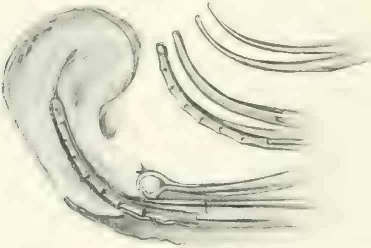

FIG. 7.—Proper curve of dilators, smooth and corrugated.

The blades of all dilators should bear a curve corresponding approximately to that usually given to the uterine sound, that is the arc of the circle whose chord is 2 inches and whose bisector is 3/8 inch. This is thought to be important because almost all our work is done with anteflexed uteri (Fig. 7).

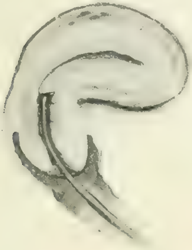

FIG. 8.

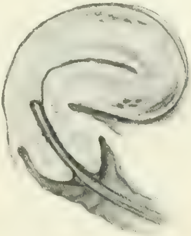

FIG. 8a.

FIG. 8.—Location of the canal on the posterior surface by the use of the uterine sound in order to determine in which direction the slender dilator of the same size as the sound may be pushed without effecting a false passage. 8A, Location of pocket on anterior wall in contrast to Fig. 8.

With the powerful dilator used under anesthesia, the notches should be of such a shape that the dilator cannot jump out. This is effected by having a gentle slope on the serration toward the tip, a steep slope toward the external os, or what might be called a "pine tree" form (Fig. 7).

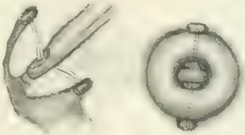

FIG. 9.—The perforated bullet or silver bean will result in less embedding than any other device.

Any attempt to pass the dilator into the uterus should be preceded by a moment's study of the passage by the sound. Its tip determines which is the straighter side of the channel and locates any ledge or jog in order that the dilator may not be driven into a pocket and cause a false passage. This action is shown in Figs. 8 and 8a.

Technic of Introducing the Glass Stem.—The patient is prepared as for any vaginal operation. A curetting outfit is made ready with two or three stems, cervix needles, and an 8- to 10-inch piece of No. 20 or 22 silver wire—the largest wire that will go into an Emmet cervix needle—the patient is anesthetized and placed on the table in the dorsal position. Vagina and cervix are thoroughly cleansed. The uterine canal is measured and a stem is selected which is slightly shorter than the canal. Curetting may or may not be done as the first step. It is usually advisable. The cervix is pulled down with the tenaculum, and the os dilated. An Emmet cervix needle is threaded on the wire suture which may be doubled. The free ends are fastened with a split shot (Fig. 9). The needle and the wire suture are passed through the posterior lip of the cervix at the cervicovaginal junction. The stem should be tested to see whether it is cracked. The stem is threaded and pushed into the cervix one-fourth inch or more deeper than is needed (Fig. 10). The suture is now passed through the anterior lip of the cervix and fastened with a second split shot. The wire suture is cut fairly close to the outer surface of the shot and the ends of the wire are turned over. Silkworm-gut may be used as a suture but it is more apt to cut out.

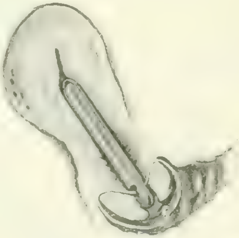

FIG. 10.—Glass stem properly placed within the external os and measured to be about half an inch shorter than the canal. The measurement of the canal has been taken before the paralysis of cureting. The stitch is placed as high as possible within the vagina.

The Dickinson modifications of the Baldwin method, although minor, have considerable practical value. They lessen the tendency of the stitch that holds the stem in place to cut out. The sole difficulty has been to keep the stem within the uterus for months. Uterine contractions, unfelt by the patient, push downward on the stem and drag on the stitch. This cuts through the cervical tissues at such a slow rate that healing occurs behind it as it travels, and its track may rarely be found (Fig. 11). But it may work through in two or three weeks. We have not seen one cut out since beginning to use the following devices. First a wire of silver of considerable size, lately we have been trying wire doubled. Second, placing the stitch anteroposteriorly; this is to place it in the area of the minimum blood supply. The third item of importance is to place the stitch as high as possible—namely, at the cervicovaginal junction or even higher (Fig. 10).

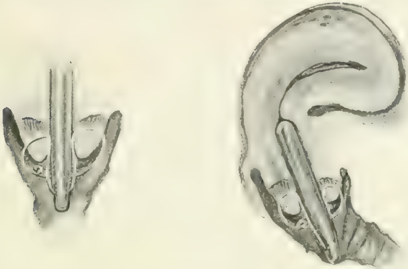

FIG. 11.—The stitch placed too low or of wire too fine or too tight cuts its way out, the tissues healing behind it.

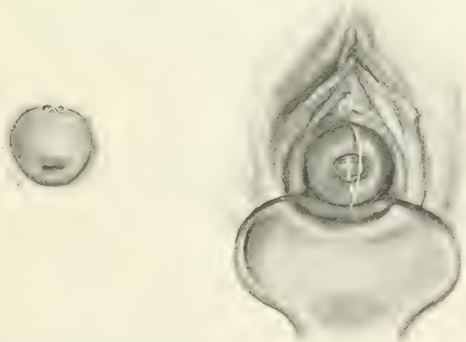

FIG. 12.—An efficient substitute for the tie of the stitch is a loop or coil at the cervical junction, front and back.

Office Use.—The other new point which we wish to emphasize in this paper, beside the mechanical principle already spoken of, is the use of the silver stem in office practice for the correction of anteflexion, sterility, and for defective development of the uterus and ovaries, by dilatation and straightening effected by the use of stems of gradually increasing size. The device first placed is often a spring such as the Chambers (Fig. 6). This does some dilatation and gauges the tolerance of the organ. The next stem placed may be either glass sewed in, or silver slipped in. Novocain and adrenalin applied to the surface or injected into the tissue of the cervix succeed in producing local anesthesia sufficient to enable one to place a small glass stem and the single stitch on the office table. This applies almost wholly to the woman with sterility due to marked anteflexion who has been married for some time. Her vulvar opening is sufficient for the manipulation and there is no vaginismus. Her vaginal walls and cervix have lost their sensitiveness by much felicitous use. Under these conditions doubled silkworm is much easier to manipulate than silver wire, though it is somewhat more likely to cut out.

Technic of Introducing the Hollow Silver Stem.—The use of the silver stem is particularly indicated in the office treatment of the class of cases with which this paper deals (Fig. 4). The procedure is as follows: The instruments are sterilized—speculum, tenaculum, uterine sound, Skene's pipette, Bozeman forceps, and dilator. The Goodell dilator is powerful and gives good results when the patient is anesthetized but, as has been said, for office work is recommended the Palmer dilator whose combined tips are the size and shape of the bulb of the uterine sound (Fig. 7). With the patient in Sims posture, the nurse holding the Sims speculum (or in the absence of a nurse, in the knee-chest posture with the bivalve speculum), the tenaculum is hooked into the anterior lip of the cervix, 4 per cent. novocain, or adrenalin 1 to 1000, is applied to the internal os by hypodermic or Skene's pipette. Cervix and vagina are swabbed with pure peroxide or with tincture of iodine. The uterine sound is passed to ascertain the length and direction of the canal, the dilator is then introduced and the external and internal os are stretched. A stem is selected which is one-fourth inch shorter than the uterine canal and small enough to slip by the internal os.

The cervical end of the stem is grasped by Bozeman forceps and the stem is inserted in the canal, the curve of the stem corresponding to the curve of the canal. The stem lies entirely within the cervix.

The patient may have some pain as from an ordinary dilatation and it is desirable that she should sit about for half an hour waiting to see that there is no uterine colic. However, we have never seen uterine colic develop in a properly fitted case. If it does occur it is because the endometritis has not been properly cared for by a preliminary course of douches and local applications of boroglyceride tampons to overcome undue sensitiveness. The after-care consists in seeing the patient in two or three days, then at intervals of a week or ten days, and finally just after each period. The silver stays bright in the uterus, but the end that may show or be touched by vaginal secretions at the external os becomes blackened. One does not worry about the cervical end being out of sight.

There is no question that the standard practice of repeated office dilatation of the whole cervical canal results in great benefit in dysmenorrhea, sterility, endotrachelitis, anteflexion, and atrophy. Our contention is that by the use of the hollow silver stem the same effect may be produced in fewer sessions.

Technic of Introducing the Outerbridge Spring.—It is possible that the Outerbridge spring is not generally used to produce menstruation in cases of amenorrhea because of difficulties or failure resulting from the lack of attention to certain details of technic. Some of these defects we have revised. First, the spring and carrier should have a marked curve in order to follow properly the bend of the anteflexion almost universal in these cases. Second, its tip should be rounded corresponding in shape with the tip of the uterine sound, as the regular sharp-pointed Outerbridge carrier could be punched through the uterine wall. Third, a foot of silk or linen thread should be tied to the base of the spring, and when the spring is on the carrier this thread should circle its base and return to the handle to take a turn round the milled screw in such fashion that it holds the spring firmly against the carrier. As the spring is shoved forward this thread is slowly released. Fourth, two small projections further assist in preventing the base of the spring from jumping loose during the slipping-off process.

The procedure is as follows: The preparation of the instruments, the position of the patient, and the preliminary process of dilatation all follow the same routine as that given above for introducing the hollow silver stem. After the withdrawal of the dilator the Outerbridge carrier bearing the spring is passed in, the thread held back a little as the spring is shoved forward off the carrier until the spreading outer ends touch the external os. The applicator is passed over to the left hand, the right hand takes the Bozeman forceps and with the points grasps the base of the spring to steady it in place as the carrier is withdrawn. The last step is sometimes unnecessary. The patient pulls the spring out by the string on the fourth or fifth day after it has been placed.

Cases Treated by the Hollow Silver Stem and Outerbridge Spring.—Of ten office cases treated for amenorrhea, dysmenorrhea and premature menopause six were unimproved and four were greatly improved. The failures were with short, early forms of stems or cases poorly followed up, three being of the obese type.

Cases Improved. CASE I.—Premature menopause in girl of defective development; atrophy of the uterus and ovaries; return to normal from wearing hollow silver stem. A girl of intelligence and healthy parentage, who at nineteen looked fifteen, presented herself with the story of menstruation beginning (as with her mother, grandmother, and sister) at the age of eleven. Normal until seventeen. She had seen nothing for two years. The uterus felt little larger than an English walnut and its canal measured 1 1/4 inches. Rectoabdominal examination showed ovaries barely palpable. The vulva was somewhat infantile in type. At the second visit the stem was passed and its size was gradually increased until within two months a size nearly 2 inches long could be worn. She went home to a distant city wearing this stem and remained four months. At the end of two years a 2-inch stem, 6 mm. in diameter, was removed for good. She has menstruated regularly since the first introduction of a stem and has changed from a backward child to a full-grown woman. Her frailty and timidity have disappeared, her breasts and her vulva have developed. The right ovary, from being the size of the little finger nail, has grown to the size of two ovaries. The left ovary has never developed.

CASE II.—Married; twenty-four years old. Premature menopause with atrophy of the uterus and ovaries; stem worn many months brings back uterus and ovaries to normal. A sensitive girl, cultured, inactive, inclined to be stout, menstruated at eleven and one-half regularly until the age of twenty-three. After six months of amenorrhea the uterus was found to be tiny and the ovaries barely palpable, the cavity measured between 1 and 1 1/4 inches. The vulva was somewhat small for her size and vaginismus existed. As in the former case, ovarian extract and lutein had produced no effect. To the Outerbridge stem she responded and a pale menstruation resulted. But the wire spring cut deeply after 5 days. Then she withdrew it. This patient wore hollow silver stems, increasing in size, from 1909 to 1912 for months at a time. Under such influence the cervical canal developed to 2 1/2 inches and the ovaries became of full size and normal tenderness. Dyspareunia and aversion have been replaced by normal response and initiative.

CASE III.—Unmarried woman of thirty-seven, living at home, came for treatment in 1911 with a history of dysmenorrhea and menorrhagia since her first menstruation at sixteen. There was marked anteflexion and endotrachelitis with a gristly canal and free secretion and defective drainage. She declined operation, so the cervical canal was scraped with the sharp curette and regular dilatation done at short intervals. In two months there was some improvement. Then the treatment was changed; a full sized silver stem was placed and worn for three months. There was much improvement in all her aches and pains and in the character of her periods. The betterment continued for six months after the removal of the stem; in the seventh month she returned begging to have her stem replaced.

CASE IV.—Married; twenty-four years old. Obesity amenorrhea cured by intrauterine stem. Stout Jewess in good health, always somewhat irregular in menstruating; had recently increased in weight and had not menstruated for eight months. Outerbridge spring placed in June; period came on a few days later. Next flow appeared of itself in October; no further period. In December a hollow silver stem was placed; flow came on two days later, lasting six days. No period until February when a hollow silver stem was again placed with the result that the flow reappeared and has been fairly regular ever since.

REPORT OF FORTY-FIVE CASES OF ANTEFLEXION AND STERILITY TREATED AT BROOKLYN HOSPITAL WITH THE GLASS STEM.

In nine of the forty-five cases the treatment is so recent that we have no results. Of the remaining thirty-six cases twenty-eight are married, eight unmarried. Of the sixteen married cases of which we have reports ten are pregnant (62.5 per cent.); six are still sterile.

In these cases the stem was worn from two weeks to eight months. In two cases lateral stitches were used and cut out. Only one antero-posterior stitch cut out.

Of the eight unmarried cases one is untraced; five cases were relieved of dysmenorrhea (71.4 per cent.); one case improved, and one case unimproved.

CONCLUSIONS.

1. A glass stem pessary of the Baldwin type may be retained indefinitely within the uterus without causing discomfort or trouble, provided it is of the proper size and is watched for the first few weeks.

2. The Dickinson hollow silver stem and the Outerbridge or Chambers spring may be used easily and effectively in office practice. The glass stem may be so used in some cases.

3. A stem pessary may cure amenorrhea that all other means fail to affect.

4. It may cure many cases of intractable dysmenorrhea where no pathological lesion or deformity is in evidence.

5. It may develop an infantile uterus, restore the organ of premature menopause or atrophy and bring back superinvolution to a normal condition. Ovarian enlargement will take place *pari-passu* with the uterine enlargement.

6. In a certain proportion of cases it will cure sterility. In these cases it is not to be used until the semen has been proved to contain numerous spermatozoa of normal shape and vigor.

7. All inflammatory conditions of the pelvic organs must be rigidly excluded.

8. The same aseptic precautions should be taken during the introduction of the stem as in other surgical operations.

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DECIDUAL CASTS

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(With Four Illustrations.)

THE term, decidual cast, is redundant but it is warranted by usage and convenience. It is a term that has come to be applied to that portion of the endometrium which is cast off during the course of ectopic pregnancy.

My purpose in writing is to call attention to the need of research concerning these casts since there are so few records as to the frequency of their observance and the time of their appearance in relation to the duration of the pregnancy. The importance of being able to recognize these casts clinically as an aid to the diagnosis of ectopic pregnancy cannot be emphasized too strongly. Recognition is difficult because these casts have no characters which are absolutely exclusive; they may be confounded with the decidua of miscarriage or the casts of membranous dysmenorrhea. The decidua of miscarriage offers difficulties in diagnosis only when not accompanied by parts of the ovum; the cast of dysmenorrhea usually because heavily infiltrated with leukocytes and because more or less necrosis has ensued.

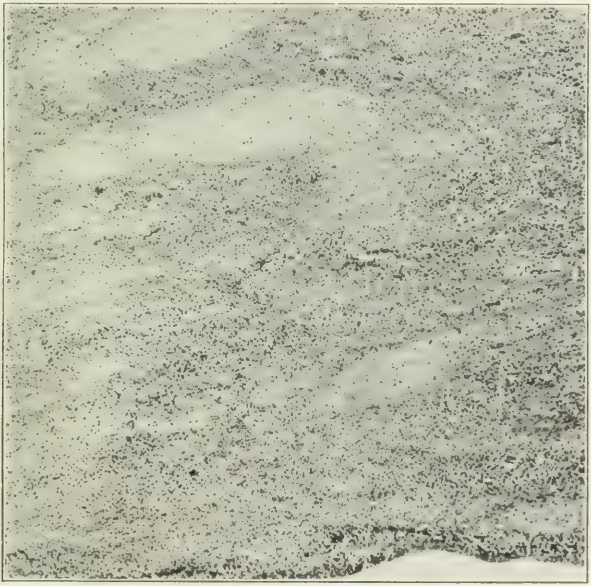

FIG. 1. Section from uterine cast of membranous dysmenorrhea. (× 85.) The cast is composed mostly of fibrin and blood cells. The edge below represents the free surface.

Some authors have written that *decidua vera* may not form in the uterus in ectopic pregnancy; if this be true it is an important observation that should be confirmed because such an anomalous

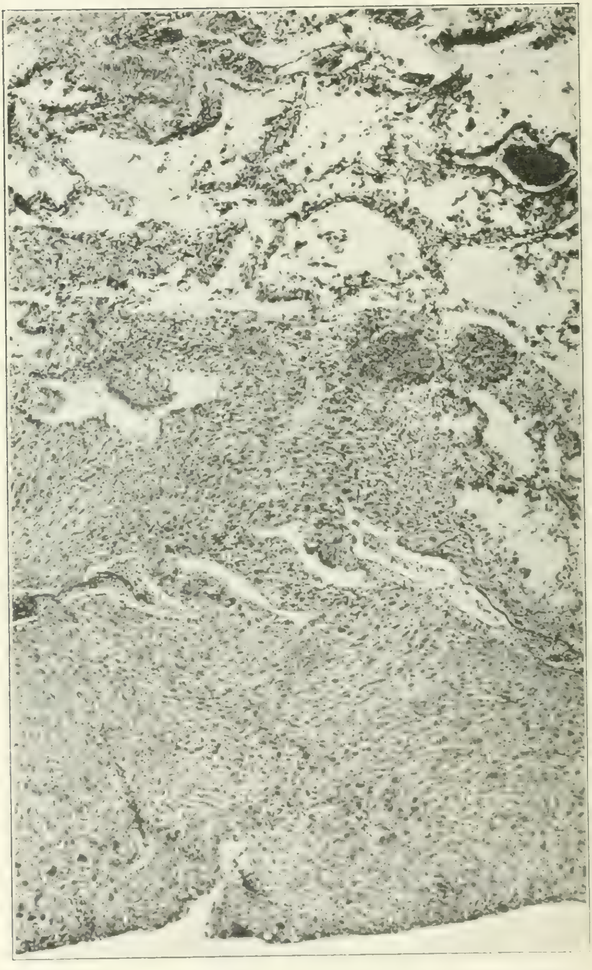

FIG. 2. Section from decidual cast of ectopic pregnancy. (× 85) Decidua compacta and free surface below.

condition may have some relation to the etiology of ectopic pregnancy. I have been unable to find any authentic report of such a case, for even in those cases where the uterus has been curetted and no decidua found one must keep in mind the admonition of Professor J. W. Williams that it may have been cast off earlier. Hirst in discussing casts as an aid to diagnosis states that they were expelled from the uterus in 45 per cent. of his cases of ectopic pregnancy. Dr. Cragin finds a history of a cast having been passed in about one-half of his cases. When one considers how easily decidua may pass out unobserved or remain in the vagina and become macerated it is not surprising that they are found so infrequently. For the purpose of diagnosis they should be sought and

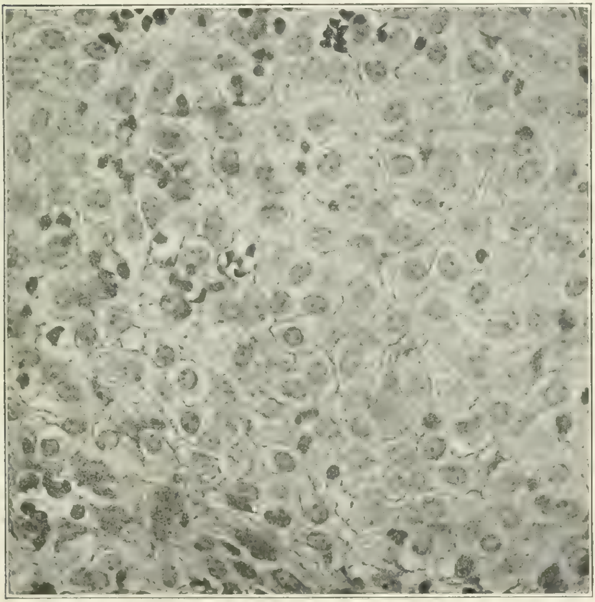

FIG. 3. Stroma cells of the endometrium in a virgin at beginning of menstruation. (× 500.) Removed by curette.

for elucidating research they should be examined whether passed before or after operation.

The Decidual Cast of Ectopic Pregnancy.—The size of the decidual cast depends upon the duration of the pregnancy at the time it is cast off. It is usually somewhat fleshy being several millimeters in thickness and is of a pink color. If it is complete and its separation has been unaccompanied by hemorrhage it forms a little sac which may be slipped over the little finger. The inner surface is smooth and glistening. The outer surface is rough or shaggy and numerous shreds of blood clot are found scattered over it. In some cases, especially when the rupture of the ectopic has caused severe anemia, the cast presents a very striking pale, pinkish, mottled appearance.

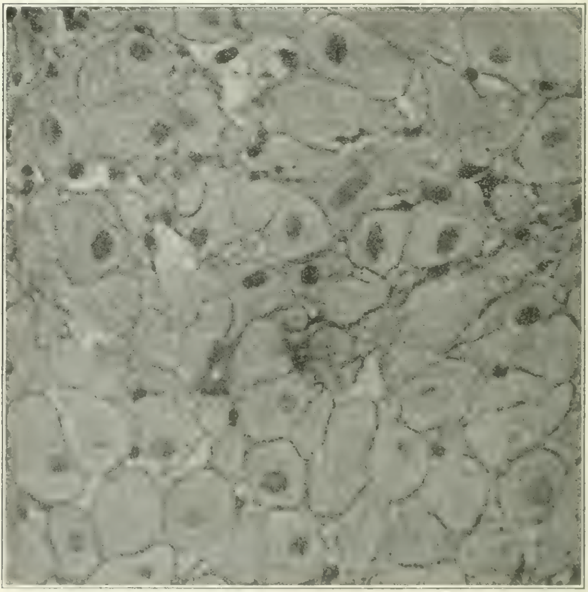

FIG. 4. Stroma cells of the endometrium in early pregnancy. (× 500.) Removed by curette. Note the size of the cells and the character of the nuclei in comparison with those of the virgin endometrium undergoing the so-called reaction of pregnancy, as shown in Fig. 3.

In cases of advanced gestation, that is of two or three months' duration, the cast may be 8×4 cm. If the separation has occurred slowly and has been attended by hemorrhage the cast may be very thick and bulky from the addition of blood clot. The microscopical appearances are those of *decidua vera*, the same as in normal pregnancy, being composed mostly of the compact layer and partly of the spongy layer. If hemorrhage has occurred into the decidua, if necrosis has supervened, or if leukocytic infiltration has taken place, the decidua will have been altered accordingly. These possibilities as well as the *postmortem* changes which occur during the exit from the uterus and the sojourn in the vagina are so variable that no two casts have exactly the same appearance, although, of course, the essential histological details are there.

The Cast of Membranous Dysmenorrhea.—The size of menstrual casts when entire is never more than 4×2.5 cm. The membrane is not so thick as decidua and is much more fragile. It cannot be handled in the same manner as a decidual cast and it does not have a cavity large enough to insert the finger. As a background for the microscopical appearances one should have in mind the appearance of the premenstrual endometrium with its elongated and tortuous glands and its swollen stroma cells. One sees that an excessive exudation of leukocytes has occurred together with the formation of more or less fibrin. This process may have been so extensive and severe as to have caused the death of the involved mucosa and it will be only here and there that the remains of an utricular gland or area of unaffected stroma may be seen. Here too one must consider the changes induced during the time of expulsion. Between the changes induced in the glands of the endometrium during the premenstrual period and the changes induced during pregnancy there is no distinct difference except in size, and this is not sufficient in degree early in the course of pregnancy to be of any aid to diagnosis. We have, therefore, to resort to the recognition of the changes induced in the stroma cells which in pregnancy undergo a distinctive change, becoming very large with translucent cytoplasm and very dense nuclei. These cells, the so-called decidua cells, which form the *decidua compacta* are so very characteristic that they are proof of pregnancy. When accurately compared with the so-called decidual reacting cell of menstruation they are found to be very much larger besides presenting dense well-defined nuclei and being packed closely together. The stroma cells of menstruation are much smaller, have pyknotic nuclei and are not firmly packed together except in small groups, the lymph spaces preventing this by being engorged.

To resume then, we may say that the *decidua compacta* is the real criterion for determining pregnancy by an examination of casts. A decidual cast indicates pregnancy, not always ectopic pregnancy because decidual casts may be passed from the nongravid horn of a double uterus during pregnancy. We must keep in mind also the possibility of cases like those of Dakin and Griffith where decidual casts were passed without finding any absolute evidence of ectopic pregnancy when operated upon later. In Dakin's case a peculiar layer of epithelial cells was found near the corpus luteum cyst that were regarded by Dr. Rolleston as relics of the Wolffian body. In Griffith's case there was no conclusive evidence of ectopic pregnancy and he suggests that an impregnated ovum probably initiated the process and then died.

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EDUCATION BUILDING.

THE PATHOGENESIS OF ADENOMYOSALPINGITIS (SALPINGITIS NODOSA)

REPORT OF TEN CASES.*

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(With Twenty-six Illustrations.)
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THE condition known as "adenomyosalpingitis" or as some term it "salpingitis nodosa" has received practically no attention in America, probably because the malady is more of pathological than of clinical interest. In foreign literature, especially the German, this lesion has been a favorite battle ground for copious, and at times, even acrimonious debate. The conflicting views may be grouped into three classes.

1. That which holds the condition to be inflammatory in origin. 2. That held by v. Recklinghausen and his school which assumes a congenital origin, due to misplaced embryonal remnants. 3. Compromises between (1) and (2).

While the lesion is by no means rare, the study of ten pronounced cases was considered by the writer as a fit opportunity to throw perhaps some light upon this much unsettled subject. The conclusions concerning the pathogenesis of adenomyosalpingitis, afforded by this study, the writer offers in the form of the following contribution.

1. *A Review of the Literature.*—In 1818 Meckel(1) described nodosities of the Fallopian tubes. Later Rokitansky,(2) Foerster,(3) Klebs(4) and Simpson(5) recorded similar cases. Their studies had reference to the gross pathology only. Most of these observers regarded the nodular thickenings in the tubes as "myomata."

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* Read before the Section on Obstetrics and Gynecology, New York Academy of Medicine, Sept. 25, 1913.

† To Dr. Eli Moschowitz, Pathologist of the Beth Israel Hospital, I express my gratitude for the suggestions and kind assistance he has rendered me in the preparation of this paper. I also wish to thank Drs. L. J. Ladinski, S. W. Bandler and H. E. Isaacs for their kindness in placing their material at my disposal.

In 1887 Chiari(6) placed the pathology of "salpingitis isthmica nodosa" on a more rational basis. In 760 autopsies on women, he found six nodular thickenings of the Fallopian tubes. A pathological investigation of these tubes led Chiari to the conclusions that these nodosities were the products of a chronic catarrhal salpingitis, which arose in the following manner: during an acute inflammatory process, the intratubal pressure reaches its maximum degree of tension; as a result the mucosa is in some parts forced outward into the softened infiltrated muscularis. These mucous membrane extrusions at first retain their communication with the tube lumen, but later, most of them become isolated, and form independent glandular spaces lines with columnar epithelium, scattered throughout the tube wall. In their new location, these adenomata undergo proliferation, and set up irritative changes resulting in an hypertrophy and an hyperplasia of the muscle fibers. To these histoid changes Chiari gave the name of "Salpingitis isthmica nodosa."

Chiari's studies stimulated many investigators to search for additional corroborative evidence. Promient among the followers and supporters of Chiari may be counted Martin,(7) Orthmann,(8) Werth,(9) and Schauta.(10)

The inflammatory theory of "salipingitis isthmica nodosa" became an accepted maxim, and for about ten years none doubted its authenticity.

In 1896 v. Recklinghausen(11) published his ingenious treatise entitled "Die Adenomyome und Cystadenome der Uterus und Tubenwandung" in which he attempted to completely overthrow the inflammatory theory, and enunciated the congenital origin of "salpingitis nodosa." The foundation upon which v. Recklinghausen built his theory is based on the following data: *A*. It is a well-known fact that in early fetal life, as soon as the Wolffian body and its canal appear, the Müllerian duct approaches the Wolffian canal, then crosses it, and finally assumes a lateral position. At this crossing point, which is at the isthmical portion of the tube, the epithelium of the Müllerian duct comes into so close a contact with that of the Wolffian canal, that a confluence of tissues may readily take place; hence the possibility of Wolffian rests occurring in the tube wall. To support this view he described minutely these adenomatous spaces as being composed of secreting tubules, collecting tubules, terminal tubules and pseudoglomeruli, all morphological components of the normal Wolffian body. *B*. The noncommunication of these gland spaces with the tube lumen showing that they are not derived from the tubal mucosa. *C*. The presence of yellow bodies or pigmented cells in the lumina of these tubules mainly the secreting tubules, which according to Mihalkovics, Tourneux, Balantyne, Williams and Czerny (quoted by v. Recklinghausen), are constituents of the ep- and paroophoron. *D.* The ciliated character of the columnar epithelium lining the adenomata. This ciliated epithelium according to Czerny is found in the tubules of the organ of Giraldes in the new-born sucklings, but disappears with the advance in growth, and is wanting even in the freshly examined adult specimens. Waldayer and Orthmann (quoted by v. Recklinghausen), claimed that only the middle portion of the tubules contain ciliated epithelium, while the collecting and the secreting tubules are devoid of it. Frey and Krause (quoted by v. Recklinghausen) on the other hand described the epithelium lining the organ of Giraldes as squamous in nature. *E.* The difference in the staining properties between the epithelium of the tube and that of the gland spaces, the former presenting a deeper hue, the latter a much lighter color, which is peculiar to fetal tissues, hence the probability that the adenomatous spaces are of embryonal origin. *F.* The comparative rarity, or, according to v. Recklinghausen the total absence of adenomyomatous changes in the cervix uteri is claimed as further evidence in favor of the congenital origin. He reasons thus: Why shall the cervix uteri, which under normal conditions is so abundantly provided with large glands, be free from adenomyomatous proliferations, while the tubal mucosa, which is ordinarily a glandless structure, be capable of giving rise to glandular metamorphosis?

These are the salient points adduced by v. Recklinghausen in support of the congenital origin of "adenomyosalpingitis." Their validity will be tested later on, after having quoted additional authorities on this subject, and after having recorded our own observations.

R. Myer(12, 13) denies completely the congenital origin of adenomyomata. This author examined 100 uteri, ranging in all stages of development from the fetal to puberty, and found that adenomatous structures are exceedingly rare. Adult uteri, on the other hand, showed glandular proliferations quite frequently. Cullen's(14) monumental work on this problem fully substantiates Meyer's claims, and is a strong argument for the acquired origin of adenomata.

E. Riess(15) in 1879 explained the origin of the adenomatous spaces in the tube wall from an anomaly of development which he termed "parasalpinx." He assumes a form of accessory tube that is lodged in the tube wall which does not communicate with the tube lumen, or with the peritoneal cavity. To our minds the anatomical demonstration of this structure is entirely insufficient. Furthermore an accessory tube that does not communicate with the tube lumen is unheard of.

Partly supporting the congenital origin, and partly favoring the diverticulum theory are Krömer,(16) Bulius,(17) Pick,(18) and Aschoff.(19) They believe that these adenomatous spaces in the tube wall are either rests of the Wolffian body, or of Gärtner's duct, or that they are tubal diverticula, which during an inflammatory process of the tube, become filled with the products of tissue necrosis and are then stimulated to proliferation. In their opinion, therefore, the adenomata are preformed spaces, lying dormant, until the activating factor of inflammation rouses them into hypertrophic and hyperlastic changes.

Maresch(20) by injecting these tubes with colored paraffin, showed that the adenomatous spaces communicate with the interior of the tube, for the paraffin found its way into their lumina. This experimental fact, to our mind, furnished a strong confirmatory evidence that the glands in the tube wall are derived from the tubal mucosa of which they form a continuation or projection into the surrounding structures.

Important clinical evidence in favor of an acquired origin of adenomyosalpingitis, are the interesting observations of v. Franque (21) and Kossmann(22). Both these authors had the opportunity to operate on patients for intraabdominal conditions extrapelvic in nature, in whom they were convinced that the Fallopian tubes at that time were normal. Subsequent to their first laporotomy these patients contracted a gonorrheal infection, and one and one-half years later, in one case, and a longer period in the second case, both of them returned for reoperation; the lesion found in the tubes proved to be an adenomyosalpingitis.

REPORT OF TEN CASES OF SALPINGITIS NODOSA.

We have arranged our cases into two main groups. *A. Those in which the adenomatous changes are limited chiefly to the mucosa. B. Those in which the glandular proliferation has extended to and beyond the muscular coats, thus constituting the true picture of adenomyosalpingitis.* This division, however, must be viewed as a conventional one, for the various gradations leading to the full development of the pathological entity under consideration, merge so imperceptibly that it precludes a sharp and distinct grouping.

GROUP A.

CASE I.—Path. No. 2781. R. I., aged thirty-three, married, has never conceived.

Menstrual History.—Began at fourteen, regular, four weekly in type of three days' duration, normal in amount and painless. Present illness. For the past three years has been suffering from pains in the lower abdomen, and from irregular and profuse menstruation.

Abdominovaginal Examination.—A partially fixed uterus and thickened and tender left adnexa.

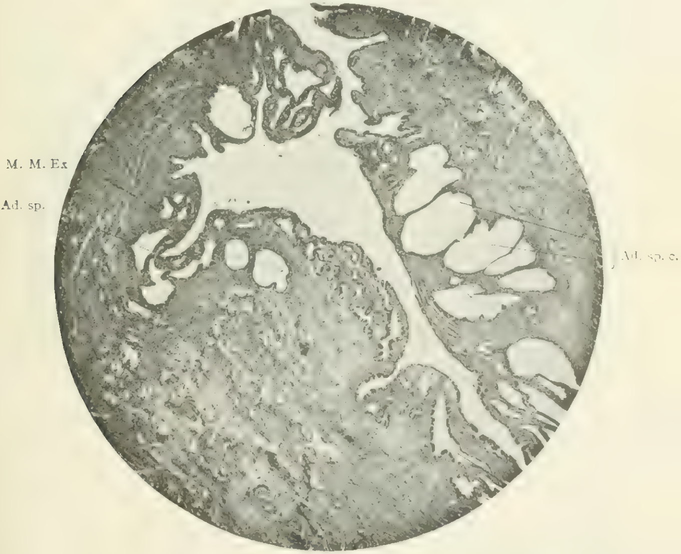

FIG. 1.—Path. No. 2781. Isthmical portion of left Fallopian tube. Adenomyosalpingitis, intermediary stage. Note the mucous membrane extrusions (M.M.ex.) forcing their way into the underlying muscularis, thus forming adenomyomatous spaces (Ad.sp.) which later become isolated from the main lumen. In other parts the glands have undergone cystic degeneration (Ad.sp.c.).

Operation.—Feb. 15, 1912, by Dr. S. W. Bandler. Double salpingo-oophorectomy.

Macroscopic Examination.—Owing to the morcellated condition of the specimen at the time when the present study was undertaken no satisfactory anatomical description could be given. We can only record that the left tube showed distinct nodular thickenings of its inner half.

Microscopic Examination.—Left tube: The lumen is dilated throughout its entire extent, the mucosa is hypertrophic, the villi are branching and form a network of irregular gland spaces, some of which are cystic, and are lined with columnar epithelium which is ciliated in parts (Fig. 1). The stroma is infiltrated in some parts with round cells. The muscular layers are rather thin and the inner one shows some hypertrophy and round-cell infiltration. At some points in the circumference the mucosa dips into the muscular layer almost through its entire thickness. *Right tube:* The lumen is represented by a narrow branching canal which is clear. The mucosa has undergone a high grade of proliferation. The villi are hypertrophic, agglutinated and form numerous gland spaces with narrow lumina lined with columnar epithelium which is ciliated in parts. Some of these spaces communicate directly with the main lumen, others are entirely separated from it. The round-cell infiltration is moderate. The muscular layers are distinctly hypertro-

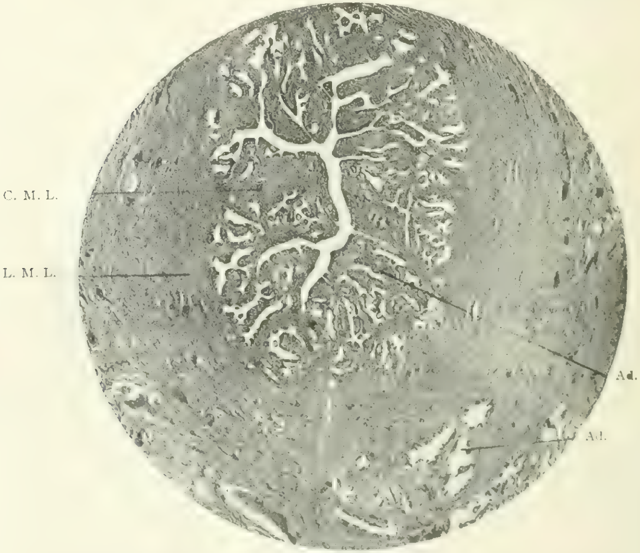

FIG. 2.—Pathol. No. 2781. Adenomyosalpingitis. Cross-section of right tube showing hyperplasia of (C.M.L.) circular muscular layer and of the (L.M.L.) longitudinal muscular layer, and a proliferation of (Ad.) adenomata.

phic. In the left lower quadrant of the field outside the longitudinal muscular layer a few adenomatous spaces are seen (Fig. 2).

Epicrisis.—A case of chronic pelvic inflammation of three years' standing which has rendered her absolutely sterile. At operation evidences of an old pelvic peritonitis with thickened and deformed tubes were found. Pathologically we find a condition of adenomatous changes chiefly in the mucosa, of both Fallopian tubes, more pronounced on the right side, where the muscular hypertrophy is also very distinct. On the left side the gland spaces are in part cystic.

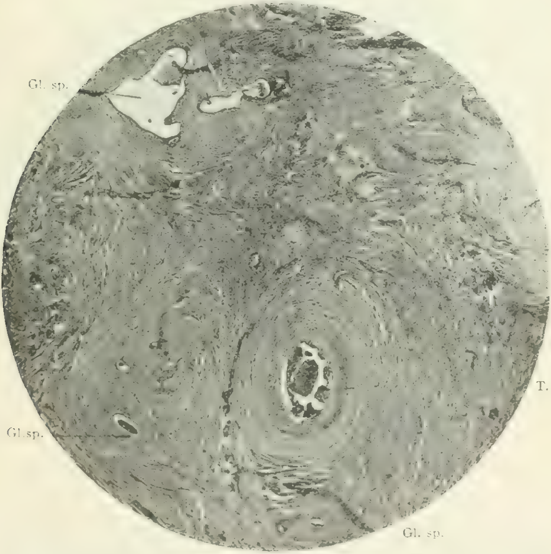

FIG. 3.—Path. No. 1585. Adenomyosalpingitis. Interstitial portion of right Fallopian tube. The mucosa of the tube (T) shows hyperplasia and infiltration with round cells. The gland spaces (Gl.sp.) lie scattered in the surrounding musculature; some of the lumina contain exudate. This portion of the tube is typical of the advanced form of adenomyosalpingitis.

CASE II.—Path. No. 1585. E. P., aged thirty-seven, married thirteen years. Had one child twelve years ago. She has not conceived since.

Menstrual History.—Began at thirteen, regular, every twenty-eight days, moderate in amount, painless. Menstruated last three weeks ago.

Present Illness.—About four years ago she was ill for a number of weeks with pain in the lower abdomen. Four months ago she was confined to bed for one week with pains in the lower abdomen. At present she is complaining of menorrhagia, metrorrhagia, and of pelvic pains.

Abdominovaginal Examination.—In the hypogastric region an irregular hard mass is felt, its upper border extending to 1 inch above the symphysis pubis. The uterus is irregular in outline and shows multiple small fibroids. Both ovaries are enlarged and cystic. The tubes could not be palpated pistinctly.

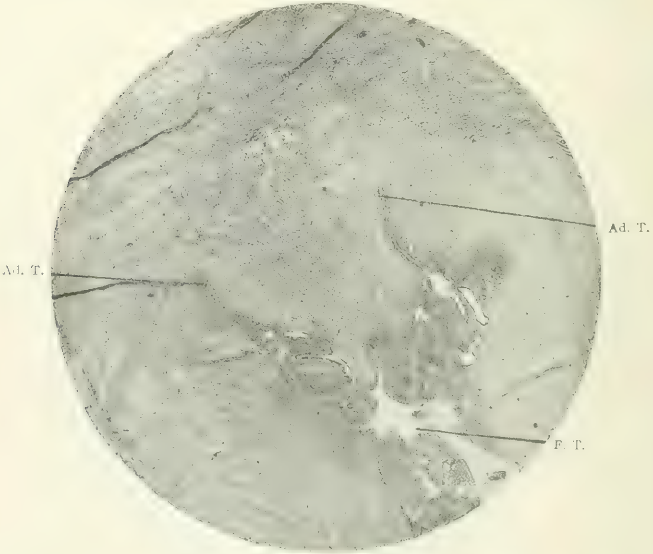

FIG. 4.—Path. No. 1585. Isthmical portion of right Fallopian tube. The mucosa is hyperplastic, infiltrated with inflammatory products and pigmented cells. This section represents the intermediary stage in the development of adenomyosalpingitis; observe the adenomatous tubules (Ad.T.), which are prolongations of the tubal mucosa into the surrounding muscle tissue, and which form the precursors of the future, apparently independent, gland spaces.

Operation.—April 25, 1911, by Dr. S. W. Bandler. Vaginal hysterectomy for multiple uterine myomata and double salpingo-oophoritis.

Macroscopic Examination.—The specimen consists of a uterus and its adnexa. The uterus is hard and firm in consistency, irregular in shape and measures 6.25×4.5×4.2 cm. Both tubes are thickened, convoluted, and are intimately adherent to the ovaries. The right tube measures 1.9 cm. in its widest diameter. The thickening in the left tube begins at a point 2.5 cm. from the uterine horn and continues in a similar manner up to its termination in the ovarian substance.

Microscopic Examination.—Right tube: The interstitial portion shows a very narrow lumen. The mucosa is slightly hypertrophied, the villi are covered with columnar epithelium which is ciliated in parts. The stroma is infiltrated with round cells. Both muscular layers are markedly hyperplastic. Outside the muscular layers in the muscle tissue (which forms part of the uterine wall) a few gland spaces are present whose lumina contain mononuclear leukocytes (Fig. 3), they do not communicate with the main lumen. *The isthmical portion* has a much wider lumen. The mucosa presents a high degree of proliferation forming adenomatous spaces, and sends prolongations outward into the muscularis, thus establishing

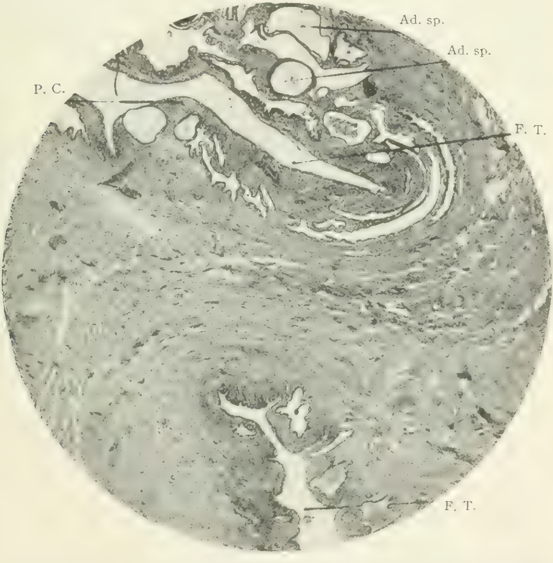

FIG. 5.—Path. No. 1585. Ampullary portion of right Fallopian tube (F.T.). In this section a double lumen appears. The mucosa shows marked hyperplasia with formation of adenomatous spaces (Ad. sp.) many of which are cystic; it is also infiltrated with many mono- and polymorphonuclear leukocytes, and an excess of pigment cells (P.C.). Some of the gland lumina contain the same inflammatory products. The glandular formation is here, in its early state of development.

a communication between the main lumen and the adenomata lying outside of it (Fig. 4). The stroma is infiltrated with many round cells, and large irregularly ovoid-shaped cells of brownish-yellow color with a homogeneous faintly staining cell body and a dark nucleus. Some of these pigmented cells resemble lutein cells, others decidual cells. The muscular layers show distinct hyperplasia, and round-cell infiltration chiefly along the course of the adenomatous extensions. *The ampullary portion* (Fig. 5) presents the widest lumen. The mucosa is hyperplastic, characterized by extensive adenomatous formations, some of which are cystic. The stroma shows round-cell infiltration, red blood cells, some polymorphonuclear leukocytes, and an excess of pinkish-yellow pigment cells (Fig. 5a). Some of these pigmented cells are also present in many of the gland lumina. The muscularis is but moderately hyperplastic. Most of the hyperplasia has taken place in the mucosa, and this proliferation extends in some portions to a very limited degree into the inner circular layer; the outer muscular coat fails to show any invasion by the adenomatous hyperplasia. *Left tube:* The tissue reaction is mainly in the mucosa, and the changes are

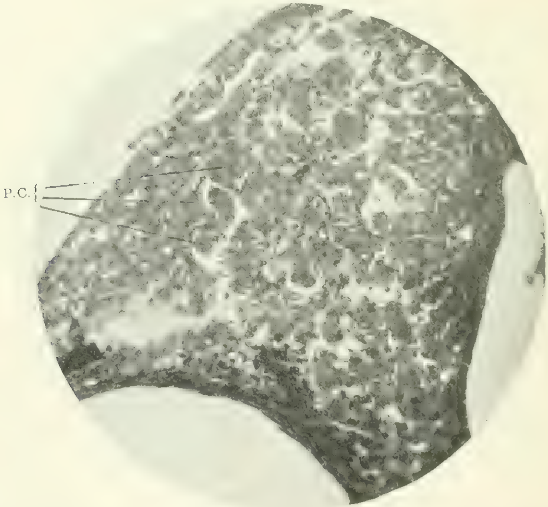

FIG. 5A.—Path. No. 1585. The tubal mucosa from Fig. 5 magnified, showing the infiltration of the stroma with the pigmented cells (P.C.). These cells often resemble decidual cells, they are pinkish yellow or yellow in color, with a faintly staining cell body and dark nucleus.

apparently of recent date, as shown by the greater number of red blood cells, of polymorphonuclear leukocytes, and an abundance of the pigment cells; also by a lesser degree of muscular hyperplasia and adenomatous formation.

Epicrisis.—This is undoubtedly a case of gonorrheal infection involving both tubes. The clinical course of the disease, its insidious type, with the repeated exacerbations, and the "one-child sterility"; all these facts speak strongly in favor of gonorrheal salpingitis. The pathological findings coincide with the clinical features. The sections taken from the hard nodular position of the tube show an older inflammatory process, the muscular tissue is hypertrophic and hyperplastic, the adenomatous changes more advanced, the round-cell infiltration less pronounced and a total absence of pigment cells. The sections from the softer parts of the tube, on the other hand, show an excess of round-cell infiltration, some polymorphonuclear leukocytes and some red blood cells, and many pigment cells in the mucosa. The muscularis shows little reaction and no adenomatous change, indicating a more acute stage.

CASE III.—Path. No. 3391. K. B., aged twenty-six, married nine and a half years. Has never conceived.

Menstrual History.—Began at twelve, every four weeks, painless and moderate in amount. Last regular period occurred six and a half weeks ago.

Previous Illness.—Since her marriage she has suffered from dysmenorrhea and from leukorrheal discharge. Six years ago a discission, dilatation and curettage was performed on her by Dr. L. J. Ladinski, for dysmenorrhea and sterility. Six months ago, the patient not having conceived, was operated by Dr. J. O. Polak, who did a curettage and a Dudley operation on the cervix.

Present Illness.—On Sept. 8, 1912, at the request of Dr. L. Miller I saw the patient, whom I found in a state of collapse. The history obtained then was the following: that morning the patient was seized with sharp lancinating pains in her abdomen, she became very weak, fainted several times and then began to bleed vaginally.

Examination revealed a markedly anemic woman, with a very rapid, small and empty pulse, which at times became imperceptible. The abdomen was tender all over, dull to percussion over the lower half. Vaginal palpation elicited fullness in the posterior culdesac and to the right of the uterus. The adnexa could not be palpated owing to the resistance offered by the patient and on account of the obesity of the abdomen.

Clinical Diagnosis.—Intraperitoneal hemorrhage due to a ruptured tubal pregnancy.

Operation.—Soon after her admission to the hospital the writer performed a right salpingectomy for a tubal abortion. The left tube was evidently the seat of a chronic salpingitis, but acceding to the wishes of the patient, it was not removed.

Macroscopic Examination.—The tube measures 7.5 cm. in length. At a point 2.3 cm. from the uterine cornu it begins to thicken into an olive-shaped node for a distance of about 1.7 cm. It then merges gradually into a thinner section which is of a softer consistency; it then widens progressively up to the fimbriated end which is patent and dilated from the blood clots that occupied its lumen.

Microscopic Examination.—Near the uterine end the lumen is narrow and free. The mucosa does not show any active changes, the villi are scant, the lining epithelium is columnar in type and is not ciliated. The round-cell infiltration is slight. The muscular layers show a high grade of hyperplasia, and scattered among the muscle bundles outside the longitudinal layer are a few gland spaces lined with columnar epithelium (Fig. 6) containing within their lumina some mononuclear cells. The middle portion of the tube (Fig. 7) has a much wider lumen. The mucosa shows an extreme degree of hyperplasia, there is an excessive proliferation of the villi with profound adenomatous formation, which have extended to the inner circular layer. The stroma is densely infiltrated with round cells and some red blood cells. The same elements occupy

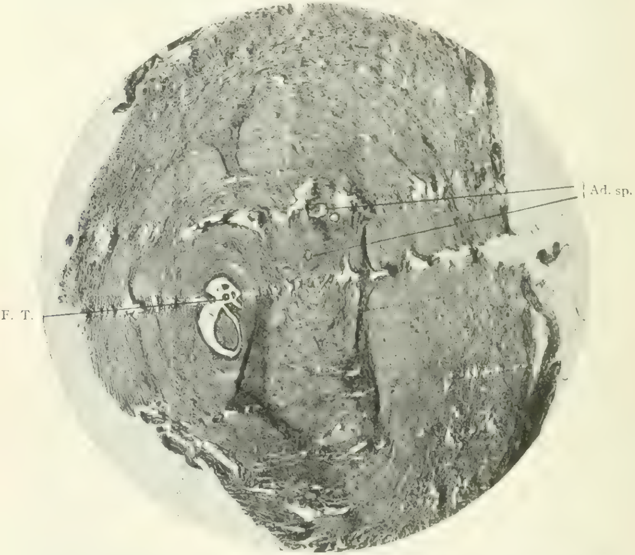

Fig. 6.—Path. No. 3391. Adenomyosalpingitis. Isthmical portion, uterine end. The lumen of the Fallopian tube (F.T.) shows no hyperplasia of the mucosa and contains masses of exudate consisting chiefly of mononuclear leukocytes. Similar inflammatory products are to be noted in the adenomatous spaces (Ad.sp.) that lie among the muscle bundles outside the longitudinal layer.

the tube lumen in a far greater abundance. The muscularis shows no hypertrophy or hyperplasia. Toward the fimbriated end the tube lumen is still wider, and the mucosa presents the same morphological changes as the isthmical part, with the exception that the adenomatous formations have not invaded the muscularis. Chorionic villi are present in the blood clots removed from the tube.

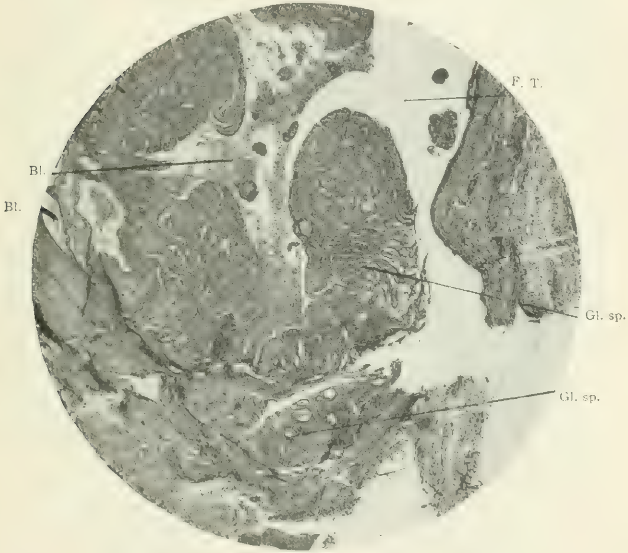

FIG. 7.—Path. No. 3391. Adenomyosalpingitis. Middle portion of the right Fallopian tube (F.T.) which contained a tubal gestation. Note the free blood (Bl.) in the main lumen and in the gland spaces (Gl. sp.). While the adenomatous formation is mainly in the mucosa, many glands are also found in the muscular layers of the tube wall.

Epicrisis.—The sterility in this patient was unquestionably due to gonorrheal salpingitis which, for manifest reasons, was not diagnosticable. The pathological changes are typical of chronic gonorrheal salpingitis. In addition we find an adenomatous hyperplasia outside of the mucosa extending into the muscular coats. This invasion of the muscularis is most pronounced in the uterine end of the isthmical portion, less so in the middle portion and least of all in the ampullary end of the tube. We lay special stress upon these findings, because it furnishes a clue to the correct interpretation of the more advanced forms of adenomatous hyperplasia of the tubal mucosa, *i.e.*, the lesion we have termed "adenomyosalpingitis."

CASE IV.—Path. No. 3448. N. L., aged forty. Married twenty-four years. One child, twenty years ago, since then has been sterile. Her labor was normal but the puerperium was complicated by a pelvic peritonitis which confined her to bed for three months.

Menstrual History.—Began at fourteen, four weekly in type, profuse, lasting from eight to ten days and clotted in character. Last period one week ago.

Present Illness.—Since her convalescence from the pelvic peritonitis following her first delivery, she has been suffering from pelvic pains, backache and profuse leukorrheal discharges. The pains are in the form of attacks varying in time, severity and duration. Fifteen years ago she had an exacerbation of her pelvic pains which confined her to bed for a number of weeks. Twelve years ago she was curetted for the relief of her leukorrheal discharge but without avail. One week ago, with the onset of her menstrual period the pains in her lower abdomen became very acute, they radiated chiefly into the right thigh; she vomited a few times.

Examination.—Blood: white blood corpuscles, 12,800; momonucl. small, 37 per cent.; polynucl., 73 per cent. Temperature 100.6, pulse 92, respiration 30. Both adnexa adherent, thickened and tender.

Operation.—Oct. 8, 1912. Laparotomy by Dr. L. Ladinski. On opening the peritoneal cavity the omentum was found adherent to the uterus and to both adnexa; the appendix vermiformis was also adherent to the fundus uteri. The adhesions were firm and well organized. The right tube and ovary, the appendix and the left tube were removed. The left ovary was so deeply buried in adhesions that it was left *in situ*. The patient made a smooth recovery.

Macroscopic Examination.—The specimen consists of the right tube and ovary. The tube measures 7.5 cm. in length and 2.5 in width at its broadest diameter. It is irregular in outline, the thickening begins at the uterine horn, becomes progressively thicker outward, and reaches its maximun at the abdominal end. The fimbriated end is closed, buried in adhesions and bent upon itself. The ovary is apparently normal with the exception of an hemorrhagic corpus luteum cyst the size of a walnut. The left tube was lost.

Microscopic Examination.—The uterine end (Fig. 8) presents a cross-section of the two tubal lumina owing to the folding of the tube upon itself. The mucosa is thickened hyperplastic, the stroma is densely infiltrated with round cells and many polymorphonuclear leukocytes. The lumen of the wide portion of the tube is occupied by a purulent exudate. The adenomatous proliferation has extended beyond the muscular coats and some of their lumina contain inflammatory products. The lining epithelium of the main and secondary lumina is columnar in type and is well retained throughout. The muscularis shows marked hyperplasia. In the middle portion of the tube (Fig. 9) the double lumen is still evident. An interesting feature to be observed is an area of dense cell infiltration that extends from the interior of the larger cross-section of the tube to the group of adenomatous space lying close to the other tube lumen. At the point where this path of round-cell infiltration leaves the tube, the muscular fibers of the inner coat seem to have separated in a direction away from the center, thus indicating a forcing outward of the mucosa by an increased intratubal pressure. The adenomatous proliferation and muscular hyperplasia are of about the same character and degree as that in the previous section. The ampullary portion (Fig. 10) shows but a single lumen, which is much wider. The mucous membrane proliferation is distinct, its stroma is infiltrated with an excess of round cells and some polymorphonuclear leukocytes. Purulent exudate is present within the main lumen. The adenomatous change is chiefly in the mucosa

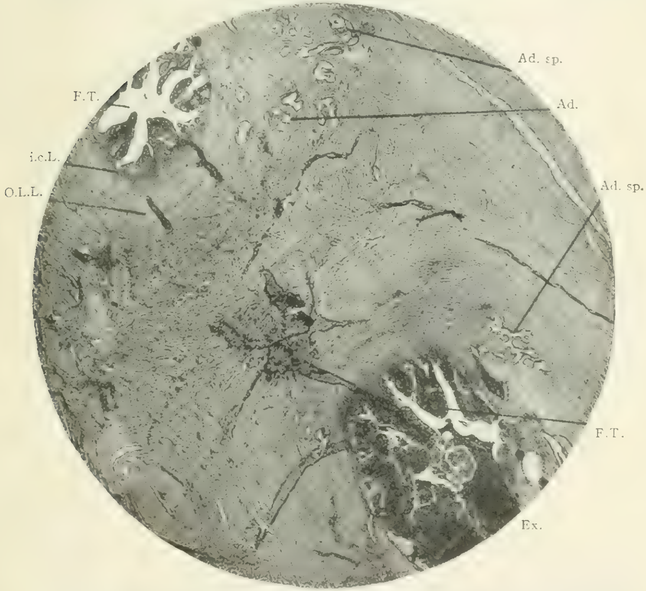

Fig. 8.—Path. No. 3448. Adeno-myo-salpingitis. Uterine end of the Fallopian tube (F.T.) showing a double cross-section. Both lumina show hyperplasia of the mucosa, which is infiltrated with the inflammatory products. In the lumina of some of the adenomatous spaces (Ad.sp.) exudate (ex.) is found similar to the one seen in the tube proper.

and to a very slight degree in part of the inner muscular coat. Both muscle layers show moderate hyperplasia and round-cell infiltration.

Epicrisis.—A case of double salpingo-oophoritis which had its inception during the first puerperium. The repeated exacerbations of the malady and the relative sterility would favor the supposition of a gonorrheal infection. At operation, an old pelvic peritonitis, with enlarged and misshapen tubes buried in adhesion were found. Microscopically, distinct adenomyomatous changes in the right tube, and also products of recent inflammation, shown by the exudate in the tube lumen and in some of the gland spaces.

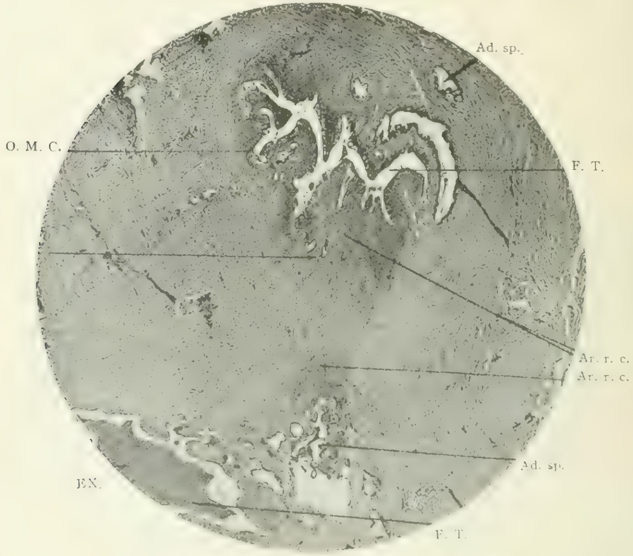

FIG. 9.—Path. No. 3448. Adenomyosalpingitis. Isthmical portion, showing a double cross-section of the Fallopian tube (F.T.) owing to its distortion by the inflammatory process. An area of round-cell infiltration (Ar.r.c.) extends from the larger tube lumen to the group of adenomatous spaces (Ad. sp.) that lie close to the cross-section of the lower pole of the field. The glandular proliferation is well advanced, the glands lie scattered outside the outer muscular coat (O.M.C.) whose fibers are separated in a centrifugal direction at the point where the area of dense round-cell infiltration leaves the tube lumen. Exudate (Ex.) is present in the main and in the secondary lumina.

CASE V.—Path. No. 2517. A. F., aged twenty-six, married five years, has never conceived.

Menstrual History.—Began at twelve, regular every four weeks, of four to five days' duration, moderate in amount. Last period terminated a day previous to her admission to the hospital.

Present Illness.—Soon after her marriage she complained of pain in the lower abdomen, especially on the left side. For the past three years she has suffered from dysmenorrhea, menorrhagia, profuse leukorrheal discharge, headaches and general weakness.

Pelvoabdominal Examination.—Uterus in the median line, anterior, not enlarged. In the right fornix an oblong, cystic tender mass is distinctly palpable. The left adnexa are apparently normal. Temperature 100.6, respiration 24, pulse 88. Urine and blood negative.

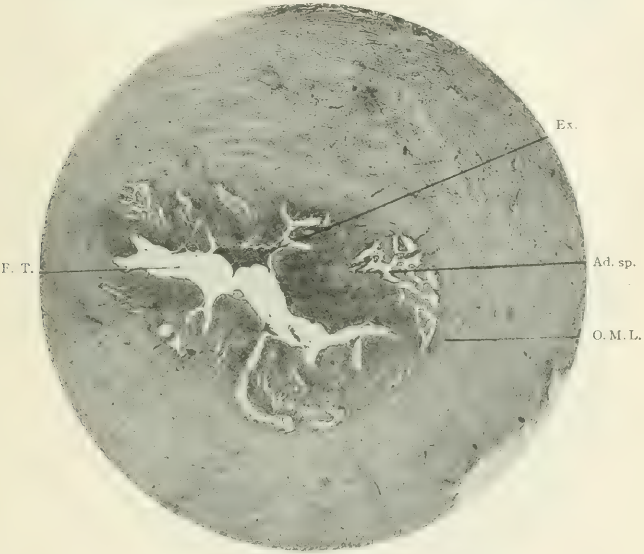

FIG. 10.—Path. No. 3448. Adenomyosalpingitis. Ampullary portion of right Fallopian tube (F.T.). The mucosa is hyperplastic, densely infiltrated with round cells and some polymorphonuclear leukocytes. The lumen contains an exudate (Ex.) which also fills the lumina of some of the adenomatous spaces (Ad.sp.). The glandular formation invaded the inner circular layer, the outer muscular layer (O.M.L.) is still free from adenomatous development.

Operation.—Nov. 28, 1911, laparotomy by Dr. S. W. Bandler. A cystic tumor the size of an orange containing a few daughter cysts was found to the right of the uterus, intimately adherent to the posterior aspect of the right broad ligament and to the lateral pelvic wall. The cystic mass and the right tube were removed. The left tube was thickened and distended, its fimbriated end closed, and about 1 inch from the uterine corner a small hard nodule the size of a hazelnut could be distinctly seen and felt. A left salpingectomy was performed.

Macroscopic Examination.—The specimen consists of both Fallopian tubes and the right ovarian cyst. The inner half of the right tube is thickened measuring 1 cm. in circumference; its outer half is densely adherent to the ovary. The left tube is much longer, measures 7 cm. in length, and 1 cm. in thickness at the uterine end, the abdominal half being of normal dimensions.

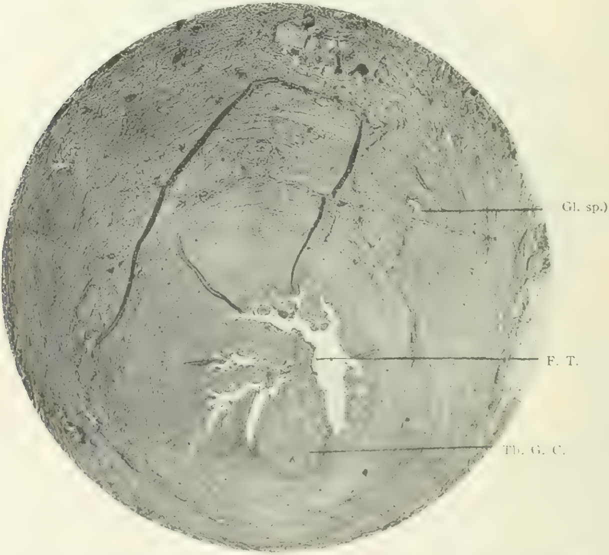

Fig. 11.—Path. No. 2517. Tubercular adenomyosalpingitis. Isthmical portion of right tube. Note the marked hyperplasia of the mucosa of the Fallopian tube (F.T.), which is densely infiltrated with round cells, tubercles and giant cells (Th.G.C.). The glandular formation (Gl.sp.) is limited, only a single space is seen in the section outside the muscular layers, its lumen containing inflammatory products similar to those found in the main tubal lumen.

Microscopic Examination.—*The right tube:* The mucosa is hyperplastic, the villi have proliferated forming slight adenomatous changes. Its stroma is densely infiltrated with mononuclear and a few polymorphonuclear leukocytes, and is the seat of tubercles and giant cells (Fig. 11). Within the lumen a moderate amount of erythrocytes and round cells and white blood cells are seen. The glandular hyperplasia has extended outside the mucosa and beyond the outer muscular layer at one point only, where a single lumen is noted. It is lined with columnar epithelium and contains the same contents as the main lumen. At the fimbriated end, inflammatory changes are present, evidenced by a more marked round-cell infiltration, but there is a total absence of tubercles and giant cells, and no adenomatous changes. *The left tube:* The uterine end (Fig. 12) shows the mucosa densely infiltrated with round cells which also extends to inner muscular layer and is the seat of tubercles and giant cells. The adenomatous proliferation is very rudimentary and is limited to the mucosa. The lumen is wide and free from exudate. The muscular coats are hypertrophied. The middle portion (Fig. 13) presents a more advanced process. The glandular formation encroaches upon the inner muscular layer, where the adenomatous spaces lie scattered between the muscle bundles. The lining epithelium is columnar, and the tubal contents as well as that of the

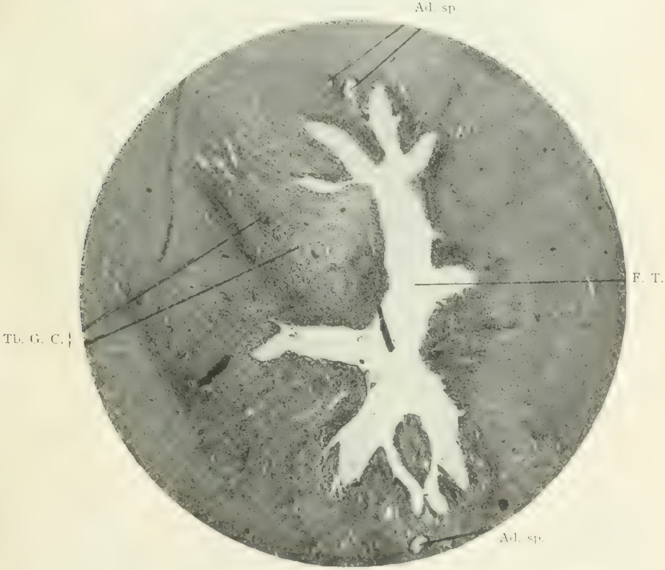

FIG. 12.—Path. No. 2517. Tubercular salpingitis with beginning adenomatous formation. Isthmical portion of the left Fallopian tube (F.T.). Note the dense round-cell infiltration of the mucosa, and the distinctness of the tubercle and the giant cells (Tb.G.C.). The adenomatous spaces (Ad.sp.) are few in number and are limited to the submucosa.

gland spaces consists of red blood cells, mononuclear leukocytes and some broken-down cells. The tubercles and giant cells are situated in the circular layer and the round-cell infiltration invades the entire thickness of the tube wall. The ampullary segment (Fig. 14) is converted into a solid adenomyomatous mass. The lumen is obliterated, and the section presents a muscular and connective-tissue framework, intensely infiltrated with round cells, containing many gland spaces and a few giant cells. Some of the gland lumina contain products of inflammation.

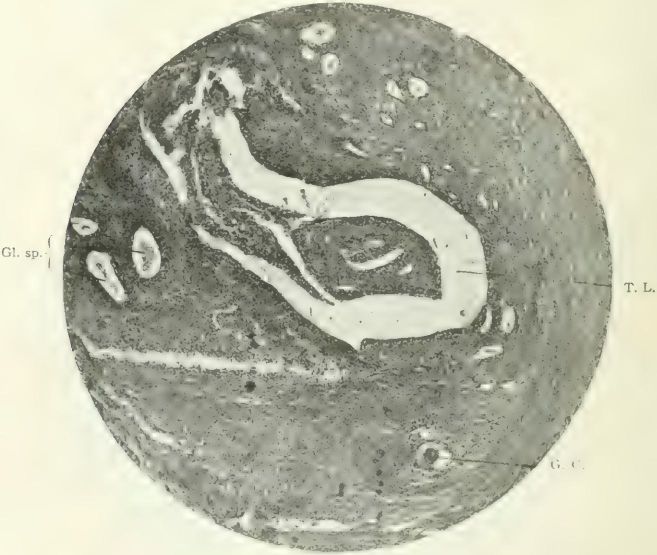

FIG. 13.--Path. No. 2517. Tubercular adenomyosalpingitis. Middle portion of left Fallopian tube. The tube lumen (T.L.) contains an exudate of red blood cells, mononuclear lymphocytes and many polymorphonuclear leukocytes. Elements of a similar nature are found in the lumina of the gland spaces (Gl.sp.). The stroma is everywhere infiltrated with round cells and contains also tubercles and giant cells (G.C.). The epithelium retains its columnar type in most parts.

Epicrisis.--A patient that reveals every clinical evidence of an inflammatory process in the genital tract. At operation signs of an old pelvic peritonitis, and a thickened left tube with the characteristic morphological changes of an "adenomyosalpingitis," chiefly at the uterine end. The right was also thickened and adherent to the ovary. Microscopically both tubes show tuberculosis and adenomatous proliferation chiefly in the mucosa and slightly in the muscularis. *On the left side the glandular changes extend as far as the ampullary portion of tube*, showing that not only is the inner half liable to undergo adenomatous metamorphosis but that the outer end is equally apt to such changes; although not so frequently.

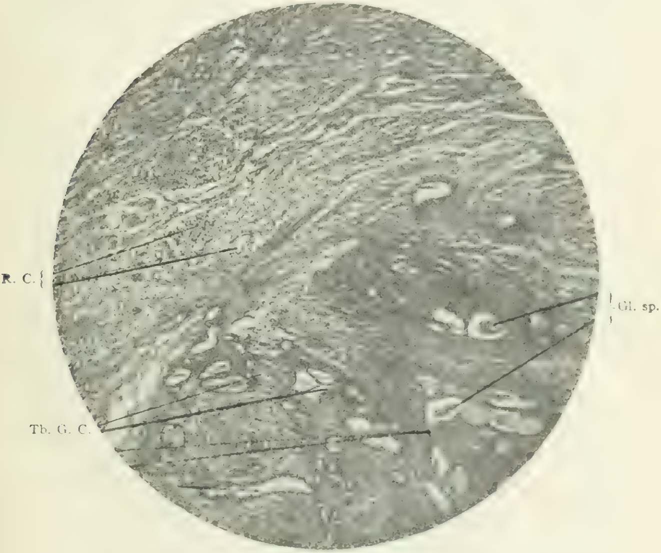

FIG. 14.—Path. No. 2517. Tubercular Adenomyosalpingitis. Ampullary portion of the left Fallopian tube. The main lumen is obliterated. The entire section is converted into a reticulated connective and muscle tissue framework, containing many gland spaces (Gl.sp.), tubercles and giant cells (Tb.G.C.). Note also the intense round cell infiltration (R.C.) and the exudate that fills many of the gland lumina.

CASE VI.—Path. No. 2828. S. K., aged twenty-one, married, sterile.

Menstrual History.—Began at fourteen, regular, three to four days' duration, painful.

Present Illness.—For the past three years has been suffering from repeated attacks of pain in the right lower quandrant of the abdomen. These pains are most severe before and during the menstrual flow. Within the last year these attacks are more frequent and severe.

Operation.—February 28, 1912, Dr. H. E. Isaacs. Right salpingo-oophorectomy and appendectomy.

Macroscopic Examination.—After having obtained the sections for microscopic study, the specimen was unfortunately lost.

Microscopic Examination.—The inner half shows a pronounced hypertrophy and hyperplasia of the mucosa, which forms a reticulated network of adenomatous spaces, lined with columnar epithelium. This gland formation fills almost the entire lumen. The stroma is infiltrated with an excess of round cells, a few polymorphonuclear leukocytes and a number of tubercles and giant cells (Fig. 15). In some parts, the tube lumen contains red blood cells, leukocytes, and exudate; similar contents are to be found in many of the gland spaces. The muscular coats show a moderate degree of round-cell infiltration and edema, but little hypertrophy, and only at one point in the circumference is a glandular formation noted outside the circular layer. The outer half of the tube presents inflammatory changes but no tubercular manifestations.

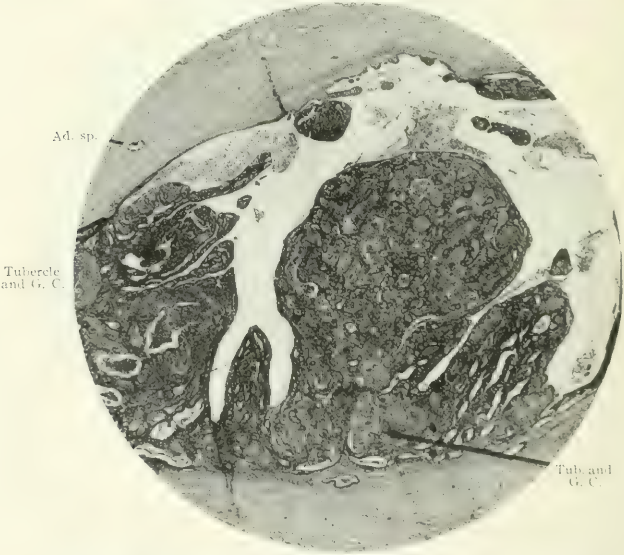

FIG. 15.—Path. No. 2828. Tubercular salpingitis with beginning adenomyomatous formation. Note the excessive hyperplasia of the mucosa with the formation of gland spaces, marked infiltration of round cells and the presence of tubercles (Tub.) and giant cells (G.C.). At (Ad.sp.) an adenomatous space is located in the edematous muscular layer.

Epicrisis.—This patient has been ailing of dysmenorrhea and pelvic pains long before her marriage. She remained sterile, these facts suggested inflammatory disease of the sexual organs. At operation a thickened, congested, nodular tube, covered with many adhesions was found, objective signs of a chronic pelvic peritonitis. Microscopically, the lesions proved to be tubercular in nature involving mainly the mucosa of the inner half of the right tube. (The left adnexa were not examined during the operation.)

GROUP B.

CASE VII.—Path. No. 1476. K. B., aged thirty-six, married eighteen years, no children, no abortions.

Menstrual History.—She began to menstruate at fourteen, irregular, every six to eight weeks, of nine to thirteen days' duration and painful. Last period began four weeks ago and the bleeding is still continuing.

Present Illness.—For the past six months she suffers from menorrhagia and leukorrhea.

Vaginoabdominal Examination.—Abdomen normal to inspection and palpation, vaginal outlet normal, serosanguinous discharge present. Uterus in the median line, somewhat irregular in shape, both adnexa are thickened and tender.

Clinical Diagnosis.—Double diseased adnexa.

Operation.—March 29, 1911. Laparotomy by Dr. L. J. Ladinski. On opening the peritoneal cavity the omentum was found adherent to the fundus uteri and to both tubes and ovaries. After separating the adhesions the pelvic contents came into view and presented a fibroid uterus and double chronic salpingo-oophoritis. The uterus, both tubes and the right ovary were removed. The patient made an uninterrupted recovery.

Macroscopic Examination.—The specimen consists of a double uterus with a subperitoneal fibroid projecting from the fundus of the right body, and of both tubes and one ovary. The right uterus measures 6.25 cm. in length, the left one 4.7 cm. in length, from the fundus to the level where it was amputated from the cervix. The subperitoneal fibroid is sessile the size of a hazelnut. The right tube is 9.3 cm. in length and irregular in outline. For a distance of 2.2 cm. from the uterine cornu it is of normal thickness, it then becomes nodular, gradually increasing in size, so that at the fimbriated end the tube is the diameter of a thumb. The nodular area is hard, while at the abdominal end the tube is soft. The left tube measured 5 cm. in length, is thickened and nodular in its entire extent, the fimbriated end is patulous.

Microscopic Examination.—Sections from the *subperitoneal fibroid* show the usual evidence of adenomyoma. The gland spaces are lined with columnar epithelium resting directly on the muscularis. No round-cell infiltration or edema is to be noted. *The right uterus* presents a marked hyperplasia and hypertrophy of the mucosa, the glands are increased in number and size, there is an excessive round-cell infiltration and edema; no signs of adenomatous changes in the muscularis. *The left uterus* shows no reaction changes. The mucosa is thin, the glands are flat and atrophic, the muscularis is normal. *The right tube* is the seat of adenomyosalpingitis in its entire extent, presenting various stages of development. *In the interstitial* (Fig. 16) and the *isthmical* (Fig. 17) portions the muscular hypertrophy and hyperplasia is very pronounced. The adenomatous formations are found in the entire circumference of the tube imbedded in muscular tissue. The mucosa of the tube lumen as well as of the gland spaces is covered with columnar epithelium partly ciliated. Within the main lumen some red blood cells and mononuclear leukocytes are present. In addition, large, irregular or ovoid-shaped endothelial-like cells of a yellow or pinkish-yellow color are found in moderate quantities. The cell bodies are faintly stained,

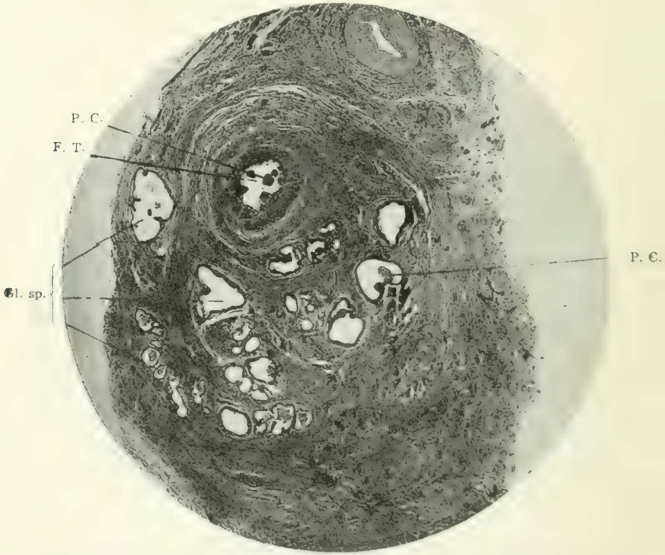

FIG. 16.—Path. No. 1476. Adenomyosalpingitis. Interstitial portion of right Fallopian tube (F.T.). The gland spaces (Gl.sp.) are irregularly dispersed in the muscular tissue, many of them are cystic, and contain pigment cells (P.C.) in their lumina. The tube proper shows the same elements in its lumen, thus emphasizing the fact that the adenomatous spaces were at some time connected with the main lumen.

while the nuclei, eccentrically situated take on a deep color. These pigmented cells are also present in many of the gland spaces. The ampullary portion of the tube (Fig. 18) resembles in every particular the lesion of advanced suppurative salpingitis, with a pronounced adenomatous formation limited in the main to the mucosa. The mucosa is thickened, the villi hyperplastic, infiltrated with round cells, some polymorphonuclear leukocytes, red blood cells and a large number of pigmented cells (Fig. 18a) both in the submucosa and in the tube lumen. The round-cell infiltration extends into the muscular layers. The glandular proliferation in this section is limited and is found in the deeper layers of the mucosa and in part of the inner muscular layer only. *The left tube* shows a high grade of muscular hypertrophy and hyperplasia; the mucosa has undergone adenomatous proliferation, there is no infiltration with round cells, red blood cells, or pigmented cells. A cross-section from the isthmical portion (Fig. 19) *shows a direct communication between the tube*

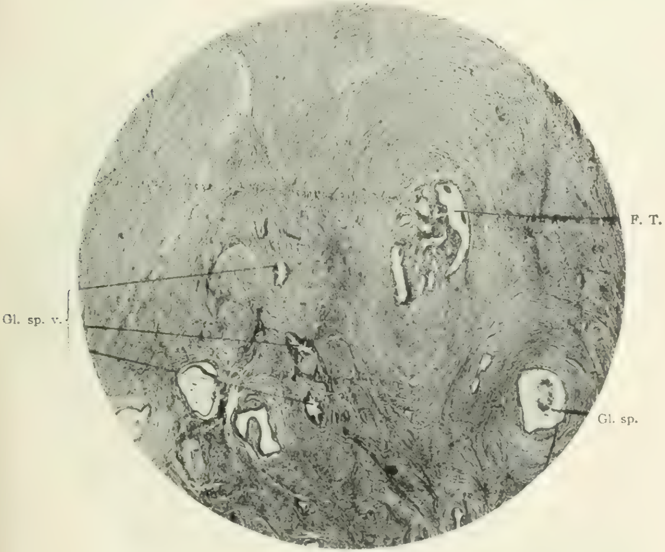

FIG. 17.—Path. No. 1476. Adenomyosalpingitis. Isthmical portion of right Fallopian tube (F.T.). The gland spaces (Gl.sp.) lie scattered among the muscle bundles, some of them have undergone organoid changes, showing an attempt by the mucosa to form villi (Gl.sp.v.). At (Gl.sp.) the muscle bundles are arranged concentrically, but there is an absence of the inner circular layer, thus distinguishing it from the tube proper.

lumen and the gland spaces, some of which are seen as distant as the subserous connective tissue; the connecting tubule traversing the entire thickness of the tube wall.

Epicrisis.—A case of double uterus, presenting clinically evidence of pelvic inflammation. At operation, old pelvic peritonitis and a pair of thickened, deformed tubes with characteristic nodules (salpingitis nodosa) at both isthmical and part of the ampullary portions. Microscopically, pronounced adenomatous proliferation of the mucosa on both sides, marked evidences of comparatively recent inflammation in the outer end of the ampullary portion of the right tube; advanced connective-tissue transformation of left tube. Characteristic changes of adenomyosalpingitis in both tubes.

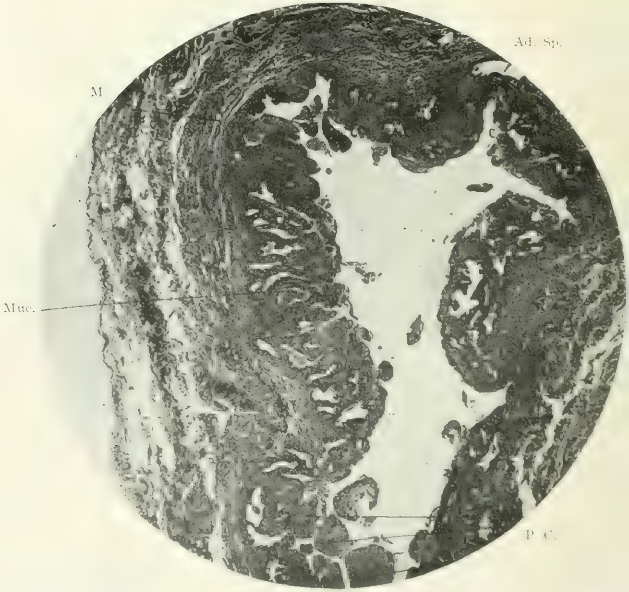

FIG. 18.—Path. No. 1476. Ampullary portion of right Fallopian tube. The adenomatous formation is slight, it invades the inner muscular coat (M) only. The mucosa has the appearance of advanced suppurative salpingitis, with an excessive infiltration of pigmented cells (P.C.) in the stroma, as well as in the tube lumen.

CASE VIII. Path. No. 2357. C. P., aged forty-five. Married twenty-three years, had one child two years after her marriage.

The labor and the puerperium were normal. She had been sterile since.

Menstrual History.—Began at fourteen, regular every four weeks, lasting three to four days and painful.

Present Illness.—For the past five years her menstruation is irregular, occurring every three to four months. For over six months she suffers in addition from lancinating abdominal pains which become aggravated on walking or stooping. She is also conscious of the presence of a mass in the right lower quadrant of her abdomen which is tender to touch. She has frequent micturition and defecation.

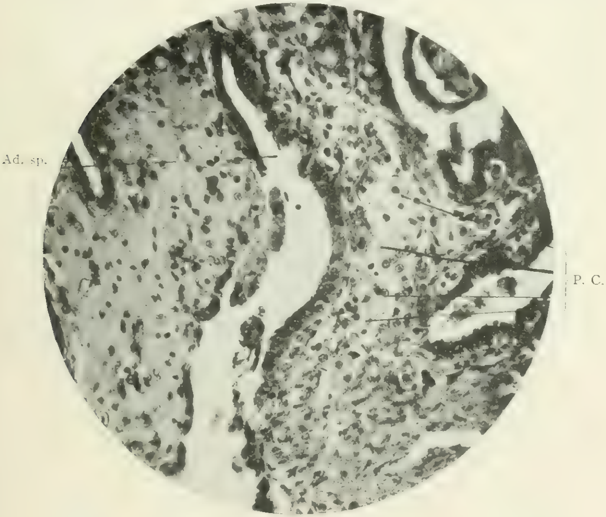

Fig. 18a.—Path. No. 1476. High power appearance of the pigmented cells (P.C.). They are of a yellow or pinkish yellow color, with faintly staining cell bodies and dark nuclei. They infiltrate the stroma of the tubal mucosa, and are also present in the lumina of some of the adenomatous spaces (Ad.sp.).

Operation.—Oct. 30, 1911. Laparotomy by Dr. L. J. Ladinski. Ovarian cyst the size of a cantaloupe was found to the right of the uterus. The tumor was fixed to the pelvic floor by its inferior surface, which was of solid consistency. The cyst and the corresponding tube were removed. The left adnexa were adherent, the tube was deformed and thickened. The left tube and ovary were left *in situ* after being freed from adhesions. The patient recovered. About three months after her discharge from the hospital the writer examined this patient and found her to be suffering from a rapidly spreading metastasis, involving the entire right side of the pelvis.

Macroscopic Examination.—The specimen consists of the right uterine adnexa. The tube is elongated, measures 13.5 cm. in length, is tortuous and alternately thick and thin. The inner third is nodular, measures 1 cm. in the tranverse diameter. The middle third has a normal appearance. The outer third is widened, very soft and merges into the ovarian substance. The ovary is converted into a cyst, monolocular in character, and on its inferior surface a hard mass, the size of a walnut is present.

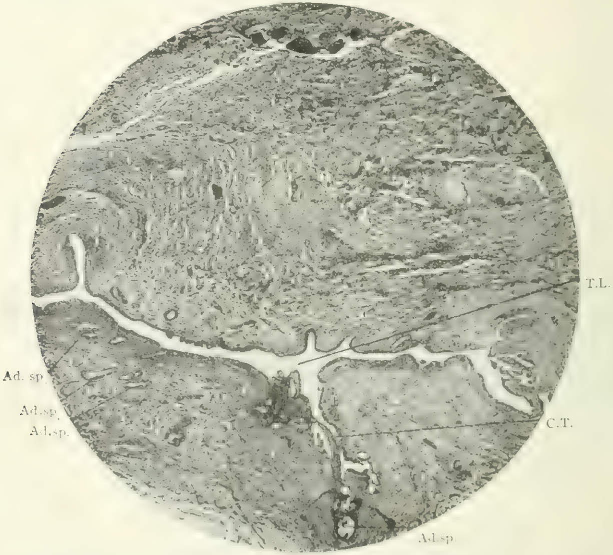

FIG. 19.—Path. No. 1476. Isthmical portion of the left Fallopian tube, presenting the pathogenesis of adenomyosalpingitis. The mucosa lining the tube lumen (T.L.) sends out extensions in various directions into the surrounding musculature. At (C.T.) a connecting tubule is seen traversing the entire thickness of the section, thus establishing a direct communication between the tube lumen and the adenomatous spaces (Ad.sp.) that lie close to the serosa. This fact teaches, that the gland spaces that are seen as separate and distinct from the main lumen, were in the beginning of their formation connected with the main lumen from which they are derivatives.

Microscopic Examination.—Sections from the hard portions of the ovary showed typical adenocarcinoma. The inner third of the Fallopian tube presented the characteristic changes of adenomyosalpingitis. The mucosa has been converted into adenomatous-like structure filling the entire lumen, the epithelium is columnar in type and ciliated in parts. Both muscle layers show marked hyperplasia and the adenomatous proliferation is present beyond the outer muscular layer. In the middle third the lumen is much wider, the villi more distinct, the mucosa is thin and consists of a single layer of columnar epithelium resting on the hypertrophied inner muscular layer, it shows no adenomatous changes. The outer longitudinal layer is not much thickened. The outer third is the widest part of the tube, the mucosa is flattened, the villi are scarce, and the epithelium is ciliated in parts. No evidences of glandular formation are to be found and the muscular layers are not hyperplastic.

Epicrisis.—A patient presenting the usual clinical evidences of a pelvic inflammation of long standing. At operation, a right ovarian cyst with a corresponding thickened, deformed adherent tube with distinct nodules at the uterine end were found. Also a chronic salpingo-oophoritis on the left side. Microscopically the nodular portion shows typical "adenomyomatous" structure.

CASE IX.—Path. No. 1687. A. L., aged twenty-eight. Married eight years, no children, one abortion seven and a half years ago.

Menstrual History.—Began at fourteen, regular every four weeks, of three to five days duration and painless. Last period three weeks ago.

Present Illness.—For a number of years she has been suffering from pelvic pains, chiefly on the right side; also headache and dysmenorrhea.

Clinical Diagnosis.—Chronic salpingitis and anteflexion.

Operation.—May 17, 1911, by Dr. L. J. Ladinski. Discission, dilation and curettage, followed by a laparotomy. A part of the ileum was firmly adherent to the posterior layer of the broad ligament on the left side and to the posterior surface of the uterus. After separating these adhesions the left adnexa which were thickened, adherent and deformed, were removed. On the right side a small parovarian cyst, and the outer diseased half of the tube, whose fimbriated end was completely closed, were also removed; followed by a salpingostomy. The patient recovered.

Macroscopic Examination.—The specimen consists of the left Fallopian tube and ovary. (The outer half of the right tube was lost.) The tube measures 10 cm. in length and is irregular in outline. The inner half is hard and nodular, the outer half is much wider and softer.

Microscopic Examination.—Cross-sections were taken from the interstitial, the isthmical and the ampullary portions of the tube. In the *interstitial portion* (Fig. 20) the lumen is very narrow, and is occupied by a few adenomatous spaces which are lined with a single layer of columnar epithelium. The stroma of the mucosa has undergone marked connective-tissue hyperplasia, the round-cell infiltration is limited to the periadenomatous spaces. The inner circular and the outer longitudinal muscle layers are hyperplastic.

The rest of the tube wall consists of irregularly placed muscle bundles enclosing in their meshes many gland spaces of various sizes and shapes. *The isthmical portion* (Fig. 21) presents morphological changes similar to those of the interstitial part with the exception that its lumen is much wider, and that the mucosa retains its villous formation in a more characteristic manner. It also shows a higher grade of round-cell infiltration which extends to the muscular layers of the tube wall. The adenomatous changes are well marked. *The ampullary portion* (Fig. 22) is the widest, it shows a marked degree of round-cell infiltration and edema. The mucosa has undergone extensive adenomatous proliferation, sending out extrusions into the underlying muscularis to various depths.

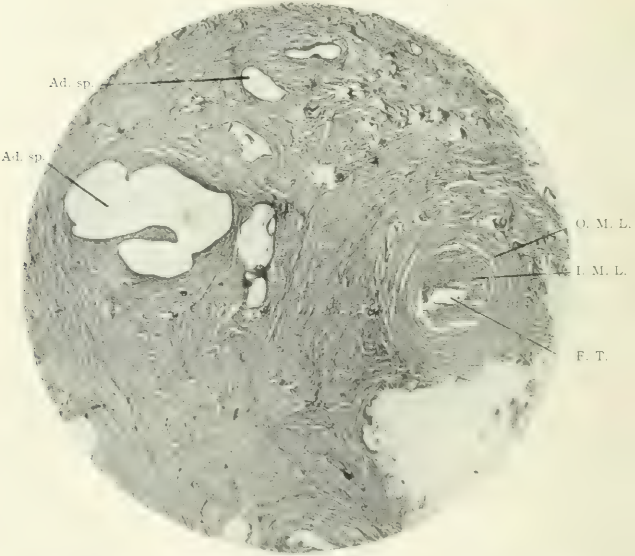

FIG. 20.—Path. No. 1687. Adenomyosalpingitis (cystica). The interstitial portion of the Fallopian tube (F.T.). The outer and the inner muscular layers (O.M.L., I.M.L.) are hyperplastic, the glandular formation is well advanced, the adenomatous spaces (Ad.sp.) are cystic in some parts. There are no signs of recent inflammation.

Epicrisis.—A patient whose clinical history is indicative of a long-standing pelvic inflammation. At operation thickened, adherent and deformed tubes, with distinct nodules at the uterine end of the left tube, and the outer half of the right tube. Microscopically intense adenomatous proliferation and hyperplasia of the muscle throughout the tube. The muscular hyperplasia corresponds in intensity to the degree of adenomatous proliferation.

Case X.—Path. No. 1208. F. S., aged thirty-four. Married twenty years, no children, miscarried three times in the early months of gestation.

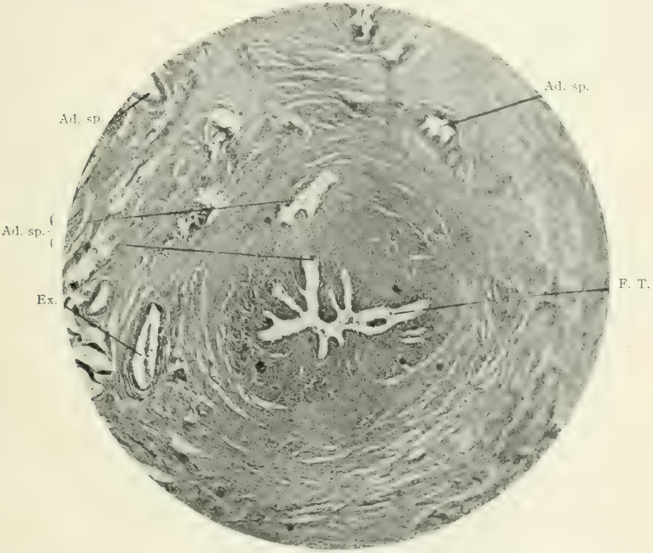

Fig. 21.—Path. No. 1687. Adenomyosalpingitis. Isthmical portion of Fallopian tube (F.T.). There is a marked round cell infiltration of all the layers. The tube lumen is much wider than in the interstitial portion, the evidences of inflammation are more distinct, exudate is present in some of the gland lumina (ex.). The adenomatous formation is less pronounced.

Menstrual History.—Began at eleven, regular, every four weeks, six to seven days duration.

Present Illness.—For the past five years has been suffering from dysmenorrhea accompanied by vomiting, and pains in both iliac regions. During the last two and a half years the pains are more marked on the left side and there is also a greenish-yellow vaginal discharge.

Clinical Diagnosis.—Bilateral salpingo-oophoritis.

Operation.—Feb. 9, 1911, by Dr. L. J. Ladinski. Double salpingo-oophorectomy.

Macroscopic Examination.—The specimen consists of both uterine adnexa. *The right tube* is nodular, measures 10 cm. in length, its outer half is bent upon itself, the fimbriated end pointing inward and backward, and is intimately adherent to the ovary. Beginning at the uterine end and extending outward for a distance of 2 cm. the diameter is 1.2 cm., its middle portion is of normal caliber; the outer third is again thickened and at its terminal end measures 1.2 cm. in diameter. The ovary is hard, smooth, of normal size and is the seat of one large and a few small corpus luteum cysts. *The left tube* measures 11.25 cm. in length. Beginning at the interstitial portion and continuing outward for a distance of 1.8 cm. the tube is hard and measures in the transverse diameter 0.9 cm. It then becomes much thinner and the fimbriated end merges into the substance of a parovarian cyst the size of an orange. At one point on the inner surface of the cyst wall the fimbriæ are spread out, and there is a communication between the cyst cavity and the tubal lumen. The ovary is adherent to the inferior surface of the cyst

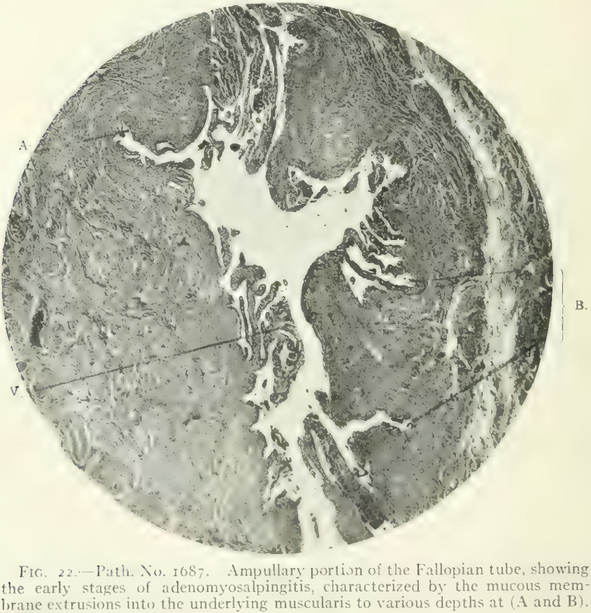

FIG. 22.—Path. No. 1687. Ampullary portion of the Fallopian tube, showing the early stages of adenomyosalpingitis, characterized by the mucous membrane extrusions into the underlying muscularis to various depths at (A and B). Villi at (V) show hyperplasia.

and measures 3.75×1.75×1.5 cm. It is studded with many Graafian follicle cysts and contains one fresh corpus luteum.

Microscopic Examination.—Right tube: The isthmical portion, corresponding to the zone where the consistency is hardest, presents a most pronounced picture of adenomyosalpingitis. The tubal mucosa is moderately proliferated, its stroma is infiltrated with round cells, the lining epithelium is columnar in type and is ciliated in parts. No products of recent inflammation are present either in the tube lumen or in the submucosa. The muscular hyperplasia is well advanced and the adenomatous formation is distinct, gland spaces of various sizes and shapes lined with columnar epithelium lie scattered between the muscle bundles of the tube wall (Fig. 23). The middle portion, where the tube is much thinner but firmer in consistency, shows morphological changes similar to those of the preceding sections only of a lesser degree (Fig. 24). The outer third, where the consistency is soft there the muscular hyperplasia

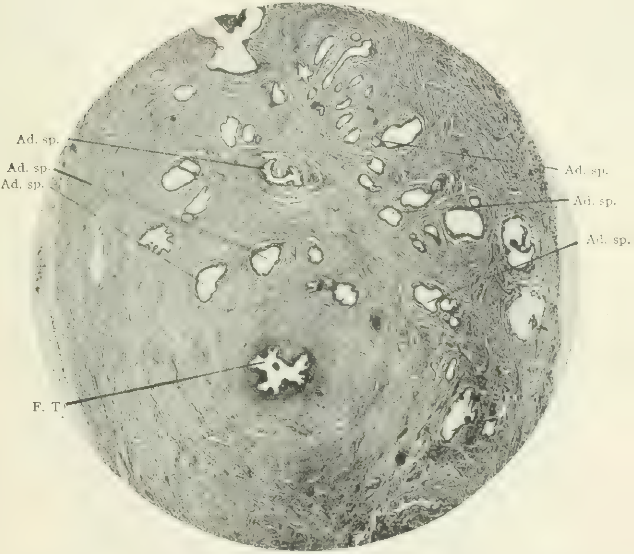

FIG. 23.—Path. No. 1208. Adenomyosalpingitis. Isthmical portion of right Fallopian tube (F.T.). The adenomatous spaces (Ad.sp.) permeate the entire circumference of the tube, they are imbedded in muscle tissue, and many of them present organoid changes.

is wanting and the greatest tissue metamorphosis is noted in the mucosa which shows extensive proliferation (Fig. 25); there are no adenomatous changes outside of it. *Left side:* The same pathological changes are noted here as on the right side, with the additional fact that the adenomatous formations are more advanced even in the softer portion of the tube where the mucosa proliferates and sends extrusions into the underlying muscularis, permeating in some instances almost the entire thickness of the tube wall (Fig. 26).

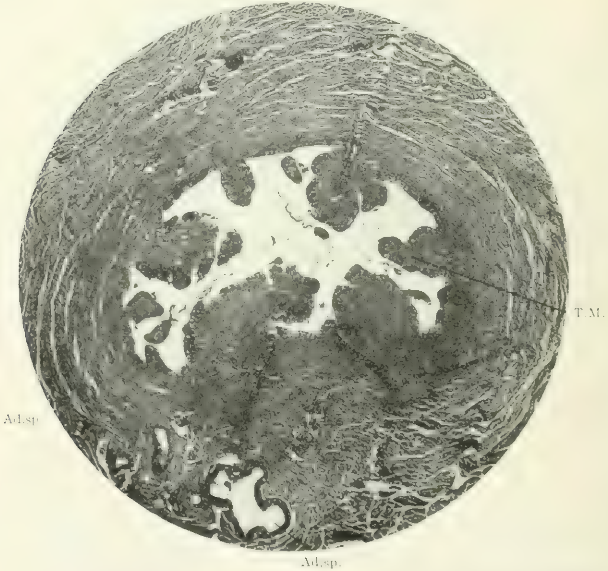

FIG. 24.—Path. No. 1208. Adenomyosalpingitis, fairly advanced form. The tubal mucosa (T.M.) shows inflammatory changes, it is densely infiltrated with round cells and some polymorphonuclear leucocytes. The adenomatous spaces (Ad.sp.) bear no direct relation to the main lumen but they are lined with the same columnar epithelium and in part show the same inflammatory reactions. Isthmical portion of right tube.

Epicrisis.—As in some of the preceding cases we have a clinical history of infection of the generative organs, dating undoubtedly since marriage. This is evident from the repeated early abortions and the subsequent sterility. Pathologically the clinical data are verified. We find a chronic inflammation of the tubes and ovaries.

The tubes are distorted, their lumina either obliterated, or narrowed by mucous membrane proliferations and distinct pathological changes characteristic of "adenomyosalpingitis" extending almost through the entire length of the tube.

III. CONCLUSIONS.

A. *Nomenclature.*—Owing to the diversity of opinions on the pathogenesis of "salpingitis nodosa" this malady has received various names. Martin (*ibid.*) calls it "endosalpingitis follicularis," Chiari (*ibid.*) "salpingitis productiva glandularis nodosa," Schauta (*ibid.*) "salpingitis isthmica nodosa," and Maresch (*ibid.*) "salpingitis nodosa." None of these terms, however, appears to us

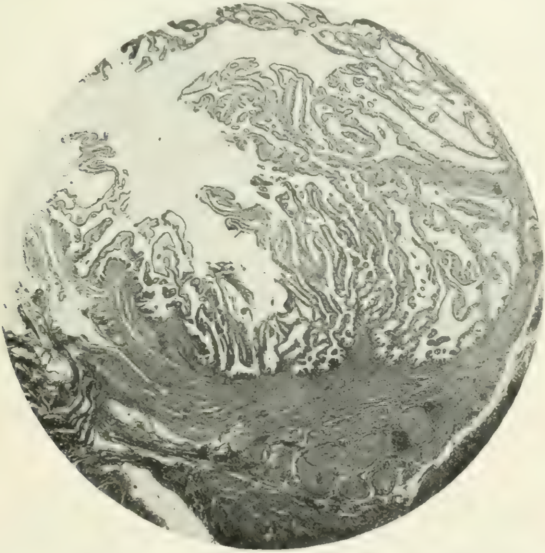

FIG. 25.—Path. No. 1208. Ampullary portion of right Fallopian tube. The mucosa shows a high grade of hyperplasia, the villi form numerous arborizations interlacing one with another thus forming gland-like spaces lined with columnar epithelium. The muscular layers show no hypertrophy and no adenomyomatous formation is to be noted anywhere.

satisfactory. The first describes an early phase of the disease when the mucosa alone is involved; the second, while more explicit, does not embody the muscle tissue changes that enter so largely into the pathogenesis. The third conveys the notion that the inner half of the tube is the only part affected, while we know that the outer half may also show adenomatous changes. The fourth definition indicates merely the external appearance of the tube. The term that seems to us to cover the various phases of the pathological anatomy of this disease is "*adenomyosalpingitis.*"

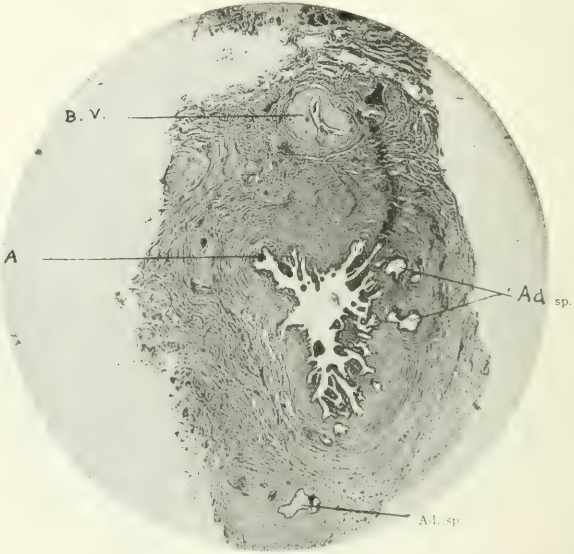

Fig. 26.—Path. No. 1208. Adenomyosalpingitis. Ampullary portion of the left Fallopian tube. Note the contrast between this section and the ampullary portion of the right tube. Here the adenomyosalpingitis is well developed, the adenomatous spaces (Ad.sp.) are found in the muscular layers, also outside of them; the mucosa send prolongations outward (A) to form glands, while on the right side no attempt at adenomatous formation is seen. (B.V.) blood-vessel.

B. *Etiology.*—Based upon clinical experience and pathological evidence we must conclude that "adenomyosalpingitis" is the result of inflammatory processes in the tube due to bacterial invasion. In our series of cases the bacterial cause is preeminent, and the gonococcus and the tubercle bacillus appear as the most frequent organisms causing the infection. Out of the ten cases included in this report, eight were in all probability of gonorrheal and two of tubercular origin, a *proportion* of *four to one.*

C. *Pathogenesis.*—In discussing the pathogenesis of "adenomyosalpingitis" I shall endeavor to prove that it is not a structural malformation of congenital origin, but that it is a distinct pathological product due to an acquired bacterial infection. This assertion is based upon the following facts:

1. Nine of the ten cases in this series were women who from the beginning of their menstrual period up to the time of their married life were practically free from any disturbances, relative to their sexual apparatus, but who soon after the commencement of their nuptual relations became sufferers from ailments of the generative organs. The tenth case, which proved to be one of tuberculosis, began to manifest symptoms for several years preceding her marriage.

2. If "adenomyosalpingitis" is congenital in origin, why is it found only in those cases presenting evidences of chronic inflammation, while the *oviducts removed during operation for causes extraneous to the tube itself, such as uterine fibroids, ovarian cyst, etc., fail to show this anomaly.*

3. *The inflammation productive of this lesion is always of a slow and insidious nature,* for in none of the cases examined have we those pathological changes typical of the acute forms of the disease. The microscopic sections, in which the "adenomyosalpingitis" has reached its highest degree of development, usually lack the elements characteristic of acute salpingitis, while in the section where the round-cell infiltration, the emigration of leukocytes, the diapedesis of red blood cells, and pigmented cells are present in significant proportions, the glandular development and the muscular hyperplasia is only rudimentary or absent.

4. *The parts of the Fallopian tube that are most commonly involved are the interstitial and the isthmical.* Not because, as v. Recklinghausen (*ibid.*) claimed, it is the crossing point of the Wolffian and the Müllerian ducts in the embryo, but because they are the first subdivisions of the tube to be affected by the ascending infection. This is not a mere hypothesis but a clinical truth substantiated by pathological findings. Those familiar with the nature and course of gonorrheal salpingitis know that this affection very frequently does

not involve both tubes simultaneously; that while one side may have fallen a complete prey to the ravages of the disease the other is still enjoying apparent immunity. This may also apply to the subdivisions of the tube. The proximal half may show marked pathological changes, while the distal portion but slight, or a beginning inflammatory process. In some of our specimens, various grades and stages of these morbid phenomena can be discerned in the same tube. In the inner third of the tube, for instance, the inflammation has run the gamut of its activities, as evidenced by the hardening and thickening of the tube wall, due to an increase of muscle tissue, in the stroma of which many gland spaces are imbedded. The tube lumen and the gland spaces are, as a rule, empty. The mucosa of the tube is thin, and the villi are few, there are no signs of acute inflammation, and the round-cell infiltration if present in limited to the mucosa and to the periadenomatous spaces. As we proceed toward the middle portion of the tube evidences of more recent inflammation begin to appear. The round-cell infiltration is more marked, it extends to the muscular layers, the mucosa is thicker, the villi more numerous, and their stroma contains many lymphocytes and polymorphonuclear leukocytes. The protrusion of the mucosa into the underlying muscularis is quite clear at many points, but the glandular proliferation is not so extensive and the muscular hypertrophy somewhat less pronounced. Toward the ampullary portion, especially at the fimbriated end the consistency of the tube is much softer due to an absence of muscular hyperplasia, for the irritating factors calling forth this muscular hypertrophy have reached this part of the tube last. The round-cell infiltration on the other hand is denser, it permeates all the layers, the mucosa is hypertrophic and hyperplastic and contains, in many instances, in addition to the mono- and polymorphonuclear leukocytes, also red blood cells and pigmented cells. The tube lumen shows the inflammatory products, which also fill the gland spaces if there are any present. Distinct adenomyomatous changes are far less common here than in the inner sections of the Fallopian tube. *In the light of these findings we are justified to deduce that adenomyomatous proliferation of the tube wall bears a direct ratio to the length of time to which it has been exposed to the infection.*

5. *The adenomata lying scattered between the muscle bundles of the tube wall are derived from the tubal mucosa.*—V. Recklinghausen (*ibid.*) denied this, for he could find no communication between the tube lumen and the gland spaces, and quoted this fact as additional support for the congenital origin of "adenomyoma."

Maresch's (*ibid.*) investigations have unquestionably proven that the secondary lumina are derivations of the main lumen, with which they do or have had a direct communication with it at some period of their formation. Our own researches purport this fact. Fig. 7 shows the direct relation between the tube lumen and the adenomatous spaces that lie close to the serosa, by means of a connecting tubule. In Fig. 18 we see the extension of the mucosa into the muscular layers to various depths, indicating a beginning glandular formation. Fig. 20 again exemplifies the direct relation between the tube lumen and the glands. *It is true that this relation cannot always be proven microscopically, no matter how many serial sections may be made, for with the advancing muscular hypertrophy and glandular proliferation the connecting tubules must finally be cut off from the main lumen and the adenomata then appear as separate and distinct spaces.* Aside from these facts, how are we to account for the identity and simultaneous occurrence of the same inflammatory products in the tube lumen and in the gland spaces, if not by virtue of the existence of a communication between these structures at some time or other? Furthermore, the attempt on the part of the glands to imitate and reproduce not only the histological component, but also the entire structure and architecture of the main organ, speaks strongly for their origin from the tubal mucosa.

6. *How does the mucosa reach the muscularis?* Chiari (*ibid.*) described it as an extension of the mucosa by the increased intratubal tension which occurs during the acute stage of the inflammation. Höhne(23) is of the opinion that intramural abscesses in the tube wall are the precursors of the glandular formation. Those abscesses break into the tube lumen, form fistulous tracts, which subsequently become lined with the tubal mucosa and assume gland-like appearances. R. Meyer (*ibid.*) entertains Höhne's view, but offers also an additional suggestion as to the possibility of their formation. He claims that as the infiltration in the muscularis reaches the endosalpingium, a locus minoris resistentiæ is created in the tube wall, through which the mucosa protrudes. V. Franqué (*ibid.*) is of the opinion that the perivascular spaces in the muscularis are the routes along which the mucous membrane extends and finds its way into the tube wall. The results of my own observations lead me to accept Chiari's teaching as the most probable one, for in those sections where the communications between the main and the secondary luminæ is still traceable, we can notice at that point that the muscle bundles separate in a centrifugal direction, *i.e.*, away from the lumen (Fig. 9).

7. *What is the significance of the pigment bodies?* V. Recklinghausen (*ibid.*) found in this, one of his mainstays supporting the congenital theory of adenomyoma. He based his contention on the studies of Mihalkovics, Tourneux, Ballantyne, Williams and Czerny (quoted by V. Recklinghausen), who have found pigmented cells, yellow epithelium and yellowish-colored cells in the urogenital apparatus of the embryo, and in some cases up to the age of puberty. As to their source, Czerny stated that all these pigmented bodies are derived from the loops of the involuting glomeruli of the mesonephron, by diapedesis, due to a degeneration of its blood-vessels. He also calls attention to the fact that the short tubules which are still connected with the glomerulus are more intensely pigmented than those further away; and which have almost entirely lost their connection with it. A careful examination of our sections offers only negative evidence to the congenital theory. If these pigmented bodies are of embryonal derivation, coming from the blood of the broken-down glomeruli of the epoophoron, they should be limited to the genitourinary tract and its aberrations, as was correctly claimed by V. Recklinghausen (*ibid.*) who found the pigmented bodies only within the tubules. Our experience differs. We have found them, not only within the tube lumen and in the gland spaces but in greatest abundance within the connective-tissue stroma of the mucosa, and only in those sections showing active inflammatory changes. Czerny's observation was right that those tubules whose connection with the main lumen is still to be recognized, contain more pigmented bodies than those more distant.

This fact once more emphasizes the inflammatory theory of adenomyomsalpingitis. The short tubules *i.e.*, the gland spaces, lying close to the main lumen and from which they are not completely separated, indicate a more recent formation; they are in an area where the inflammatory process has as yet not completely subsided, and therefore show more of the acute of subacute inflammatory elements such as pigmented cells, etc.; while those further away from the lumen, which have been cut off by the enclosing muscle fibers, contain very few or no pigmented cells, because here the process is not active, absorption is completed, and the resulting metamorphosis is fully established. Recently Pick (*ibid.*) has written on the findings in old pus tubes and described certain cells (possibly the same cells considered by others as pigment cells) as being fatty in nature. We have therefore submitted the sections containing pigmented cells to a hematogenous pigment stain and to a Scharlach R. .stain for fat. The results were negative. The fact that the pigment cells occur chiefly in the areas where other inflammatory evidences are present leads us to agree with Czerny (*ibid.*) that they are hematogenous in nature, but we do not coincide with him as to their origin. They do not come from the blood-vessels of the involuting glomeruli but are the result of the hyperemia, the congestion and the diapedesis that accompanies every inflammatory process.

IV. SUMMARY.

1. *Adenomyosalpingitis* (salpingitis nodosa) is inflammatory in origin.

2. It is one of the final stages of microbic infection of the Fallopian tube.

3. The most common microbic infections are the gonorrheal and the tubercular; in our series the proportions are as four to one.

4. The theories that adenomyosalpingitis is a congenital or a blastomatous process, has thus far received no substantiation.

5. The term adenomyosalpingitis best expresses the pathogenesis of this lesion and should be generally adopted.

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THREE UNUSUAL TUMORS.

CARCINOMA AND SARCOMA MAMMÆ. KRUKENBERG TUMOR. ADENOMYOMA CERVICIS.

BY

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New York City.

(With Four Illustrations.)

(From the Pathological Department, Woman's Hospital, New York City.)

THE following three cases are reported because of their rarity and the pathological interest of the system of tumors which they represent.

CASE I.—Mrs. J. H., aged fifty years, was admitted to the Woman's Hospital, June, 1909, for a tumor of the left breast. This was removed with a subsequent pathological report of chronic mastitis. In November of the same year she was readmitted for a recurrence of the tumor. A Halstead operation was performed by Dr. Chambers and the pathological examination disclosed a carcinoma of the *left* breast with involvement of an axillary gland.

In July, 1910, the patient was again admitted for myoma uteri and a supravaginal hysterectomy was performed.

The section of the myoma showed according to the pathological report (Dr. Jessup) the center of the myoma softened, with poorly staining, granular tissue in this portion of the tumor.

In December, 1912, the patient was again admitted on account of a hard tumor in the *right* breast. The right breast was removed together with a bean-shaped subclavicular gland. Sections of the breast itself showed long strands of epithelial cells scattered between loose bundles of connective tissue. Only here and there occurred conglomerates of epithelial cells suspended in a meshwork of fine fibrous tissue (Fig. 1). The cells were polygonal with little optical unrest. These cell strands penetrate the whole breast tissue. The section of the subaxillary lymph gland revealed the remarkable fact that the gland, which measured 2 1/2 by 2 1/2 cm., was entirely replaced by dense *spindle* cells interspersed by *giant* cells in which mitoses were numerous (Fig. 2). These give the sections the very diversified appearance of a giant cell sarcoma. In January, 1913, a small node from the right shoulder and one from the abdominal wall near the umbilicus were removed. Both showed the characteristics of a spindle cell sarcoma. The examination of a gland from the right axila showed the whole lymphoid tissue replaced by a medullary growth of polyhedral epithelial cells which were in every detail the same type as the cells composing the mitoses in the right breast tumor.

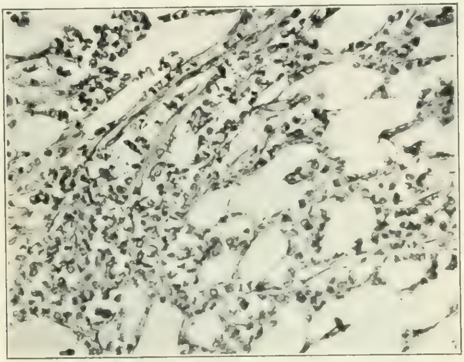

FIG. 1.

This case presents a primary glandular carcinoma of the left breast, which after a number of years produced a metastasis in the right breast. But here also at the same time is found a spindle celled sarcoma, while of two neighboring glands one is sarcomatous (subclavicular) and the other carcinomatous (axillary).

There is no doubt in regard to the origin of the carcinoma, but the primary focus of the spindle cell sarcoma remains to be considered.

The two malignant growths have, from our description, no relationship whatever.

The fact that two sarcomatous nodules appeared practically at the same time, one in the breast and one in the lymph node, points strongly to the conclusion that both are metastases from a primary growth in some distant organ.

Many attempts have been made to draw a histological distinction between sarcomata arising from muscle tissue and from connective tissue, but these are inconclusive and unreliable. Ogorek, in a recent article on myosarcoma uteri, shows illustrations to prove this distinction. Following these, the present case would appear to be of myogenous origin. We have, however, more suggestive evidence of this, in the pathological report of 1910, in which the myoma uteri is described as follows: "There is a poorly staining, granular tissue which resembles pus."

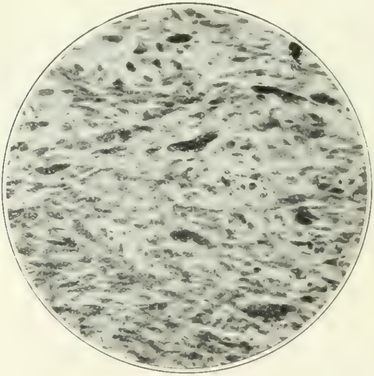

Fig. 2.

The metastases in the abdominal wall, in the shoulder and in the mamma which occurred more than two and one-half years after this myoma was removed may well have originated from this single uterine focus.

The coincidence of sarcoma and carcinoma in the breast presents several possibilities. First, carcinoma and sarcoma starting independently from different elements at the same time. Second, carcinoma causing sarcomatous metaplasia of the connective tissue stroma (carcinoma sarcomatodes) (cases of Coenen, Schlagenhaufer). Third, a carcinoma starting in a primary sarcoma (case of Ribbert). Fourth, one or both of the tumors may be metastatic. This applies to the present case.

Whatever may be the mode of origin this double neoplasm is very remarkable. Such cases have been described by Mönckeberg, H. Landau, P. Grawitz, Saltykow, and Nebesko. Nebesko describes a carcimona mammæ with a polypoid spindle cell sarcoma in an enlarged uterus. He adds that there was epithelial metaplasia with cancroid pearls in the polyp, the accuracy of which observation is doubted by Lubarsch.

Case II.—Pathological No. 5588. Mrs. R. S., aged thirty, private case, operated upon by Dr. Coe at the Woman's Hospital, May 9, 1911.

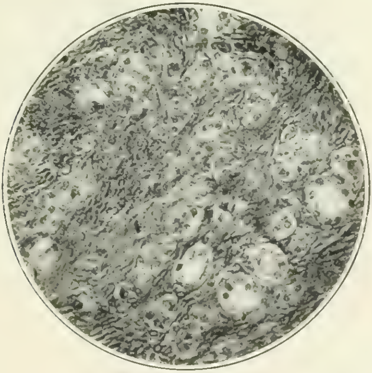

Fig. 3.

Both ovaries, which were removed with the corresponding tubes, were changed into large tumors with a smooth outer surface free from any adhesions. One ovary measured 12×7×7 cm., the other ovary 14×12×5 cm. The larger tumor contained a cyst about the size of an egg, which contained a straw colored fluid. The solid stroma of both ovaries was of a yellowish white color, moderately hard on section.

Microscopical examination showed that almost no trace of normal ovarial tissue remained with the exception of a few corpora albicantia, and a thin layer of tunica albuginea. The tissue consists in the main of dense but irregular strands of fibrillar stroma. Between these lie conglomerates of polygonal epithelial cells, sometimes solid and sometimes arranged around a lumen with the nuclei pressed toward the bases of the cells (Fig. 3). In places the stroma alone appears and the epithelial portion of the tumor is absent.

There are edematous areas in which occasionally the epithelial cells may be seen with a flat nucleus at the periphery of the large round cell body. These strongly suggest signet ring cells, but owing to the fact that the tumor was preserved intact several years in formalin before the sections were taken the morphology cannot be accurately determined. The cells forming the tubules above described contain a mucoid substance in their protoplasm. In a Van Gieson stain the dense hypertrophied stroma stains yellow. These characteristics lead us immediately to the diagnosis of a Krukenberg tumor, a type of growth first described by that author in 1896. On account of their particularly fibrosarcomatous structure he called these bilateral tumors, *fibrosarcoma mucocellulare carcinomatoides;* this latter adjective indicates that there is always a malignant growth of epithelial character present in the tumors.

Schlagenhaufer, more than Krukenberg himself, has proved that most of these tumors are bilateral metatases of colloid carcinomas of the intestinal tract. It appears that the ovaries are special sites of predilection for metastases of intestinal carcinomata and that the ovarial stroma is very liable to undergo a resultant fibrosarcomatous degeneration. It has not been determined whether the signet ring cells which are most frequently present in the myxomatous portions of the tumor originate from the carcinomatous (epithelial) part or from the sarcomatous stroma. It has been demonstrated by the cases of Schenk, Glockner and Krukenberg that the same type of tumor may develop in both ovaries primarily, since the exact autopsies in the three cases of these authors showed no other focus anywhere in the body. In the case we are now reporting the patient ultimately died at home and no autopsy was performed so that the primary origin is unknown. Clinically, however, there were no symptoms of a tumor in the intestinal tract.

Case III.—Path. No. 7677, Mrs. E. B., thirty-nine years old. Admitted for irregular menstruation and dull pain in the left lower abdomen together with headache. At operation by Dr. Flint the corpus uteri and both adnexa were removed from dense fibrous adhesions, especially in the culdesac. The uterus was enlarged and of irregular shape, the myometrium was far thicker than normal, partly from the presence of a number of myomata ranging from 1 to 4 cm. in diameter. The corpus uteri measured 14 cm. in its longest diameter. The myometrium adjoining the cervical portion was 4 1/2 cm. wide, and showed numerous small gaps in the firm and pale tissue. Both tubes were changed into hydrosalpinges and were connected to the ovaries by hyperemic fibrous bands.

Microscopical examination showed that the minute gaps in the myometrium were filled by irregular gland formation which penetrated in winding and branching systems everywhere through the musculature (Fig. 4). These glands show a single layer of high columnar cells with the nuclei at the base and the protoplasm staining faintly blue with hematoxylin. The cells rest on a basal membrane which is present in all the tortuosities everywhere throughout the myometrium. The gland cells are typically of the cervical variety and the glands are proliferating cervical glands. A well capsulated myoma of 1 cm. diameter located in the diffusely thickened myometrium of the lower part of the corpus uteri shows the same glandular lumina amid the ordinary myomatous tissue (Fig. 5). There is no actual replacement of the myometrium by these glandular aggregates, they appear rather to fill and widen the normally present lymph spaces in the muscularis uteri by their excessive growth. There is no optical unrest, nor more than one layer of epithelial cells lining the glands. An elastica stain shows numerous elastic fibers, which proves that the stroma between the glandular structures is regular musculature and not myomatous tissue.

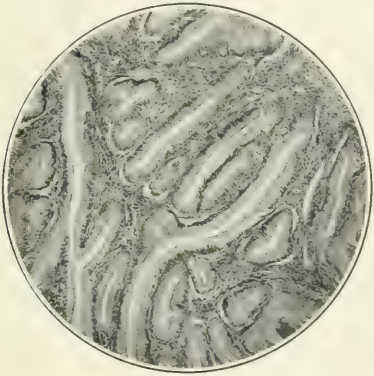

FIG. 4.

We have to deal in this case with the condition described first *in extenso* by Von Recklinghausen (Adenome und Cystadenome des Uterus, Berlin, 1896). Since this excellent publication a large amount of literature has appeared with a wide variety of opinions on the correctness of Von Recklinghausen's interpretation of these structures. Stated briefly, Von Recklinghausen ascribed the origin of these tumors chiefly to remnants of the Wolffian body; Cullen derives them from the Müllerian ducts, Kossmann calls the tube-corner adenomyomas derivatives of accessory tubes. From all these different opinions emerges the fact that there is more than one kind of adenomyoma and more than one possibility of origin. R. Meyer is probably the best authority on these peculiar glandular structures which occur in such varied locations as the hilus of the ovary, the round ligament, the tube corner, the corpus uteri and very rarely in the cervix uteri. His original conception was that they were of embryonal origin. Since it is impossible here to discuss the question of embryonal origin for adenomyomas of the entire female genital tract, I would say in brief that the concensus of present opinion is that all except those of the round ligament and ovary are of postfetal life. This opinion is derived from the extensive studies of R. Meyer, Maresch, Hoehne, Von Franqué and numerous other authors. In our case the epithelium, which shows the characteristics of the cervical epithelium, is a strong point for the direct origin from the cervical glands, since the far more frequent adenomyomas of the fundus uteri show corpus epithelium lining the glands. It is not to be expected that two different types of epithelium would occur in the Wolffian remnants. Moreover the large amount of elastic fibers in the musculature around the glands justifies the opinion that the excessive hypertrophy of the muscularis is a secondary change, not a tumor formation (myoma). The large amount of lymphoid infiltration around the glands might indicate the inflammatory origin of the adenomyoma, but of this there is no certainty, since it might certainly be secondary to the formation of the glands.

The penetration of the glands through the entire myometrium, as far as the serosa, does not indicate malignancy. Even the cases of Von Franqué, Sitzenfrey and Füth, where neighboring organs (the rectum) had to be resected on account of the invasion of these glands, were not regarded by these authors as malignant. No recurrence occurs after the removal of the original growth nor is there any metastasis.

Cullen excised merely a wedge-shaped piece of the corpus uteri in one of his cases, but the adenomyomatous tissue remaining in the uterus showed no further development.

The rarity of cervical adenomyomata and the invasion of a corpus myoma are the striking features of this case.

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179 East Seventy-Ninth Street.

THE ABSTRACTION OF CALCIUM SALTS FROM THE MOTHER BY THE NURSLING THE CAUSE OF THE COAGULATION OF THE MILK IN THE MAMMARY GLANDS OF THE FORMER.

BY
JENNIE G. DRENNAN, M. D., C. M.,
Arrochar, Staten Island, N. Y.

One notices quite frequently in the nursing mother the formation of coagulated milk in the mammary glands. This is attributed by the laity and sometimes by the physician to the action of cold. The mother is thought to have been overheated and suddenly chilled. Probably this, as a causative factor, is as incorrect as that cold causes pneumonia, etc. That the abstraction of calcium salts from the mother by the fetus and nursling has the effect of causing many abnormal if not pathologic conditions I am convinced, and I fancy that time will show this theory to be correct. So few mothers have a proper diet. Many of them think that they must imbibe quantities of fluids, irrespective of their quality. Tea, coffee, beer, etc., will in their opinion supply the materials necessary for a full supply of milk and it is quantity not quality that they think is necessary. They prefer the stimulating effects of these to the less apparent stimulation of milk, which contains all the elements necessary for the maintenance of life, and in an easily assimilable form. Many do not like milk and will not drink it. In these women their bodies are being drained of the required amount of calcium, therefore they should replenish this loss by partaking of foods rich in this substance.

Milk deprived or poorly supplied with calcium coagulates quickly because it requires the presence of free calcium to prevent its casein from being thrown down—add acid to milk and you have a precipitate of casein. Now if the mother's calcium content has been for some time drained, finally there will come a time when there will not be a sufficient amount available to prevent the milk from coagulating and the formation of coagulated milk will occur in the milk ducts. If we were to look for it in these patients in whom "caking of the breasts" occurs we no doubt would discover other signs which would lead us to conclude that it was the lack of calcium salts in her blood which was at fault; these same women, if questioned, would give information concerning the insufficiency of liver function and describe themselves as "all in." It is considered normal by pathologists that a certain amount of fatty infiltration should occur in the liver cells of the central zone; now this may be usual but I do not see why it should be considered normal. I should rather consider it as being due to a deficiency in the calcium content of the woman, which ought not to occur; this fat in these cells being there simply because there was not sufficient calcium present in her blood to unite with this fat to form lipoids in which form fat is conveyed to its normal depôts in the body and there deposited.

Wadsworth Hall.

IN MEMORIAM.

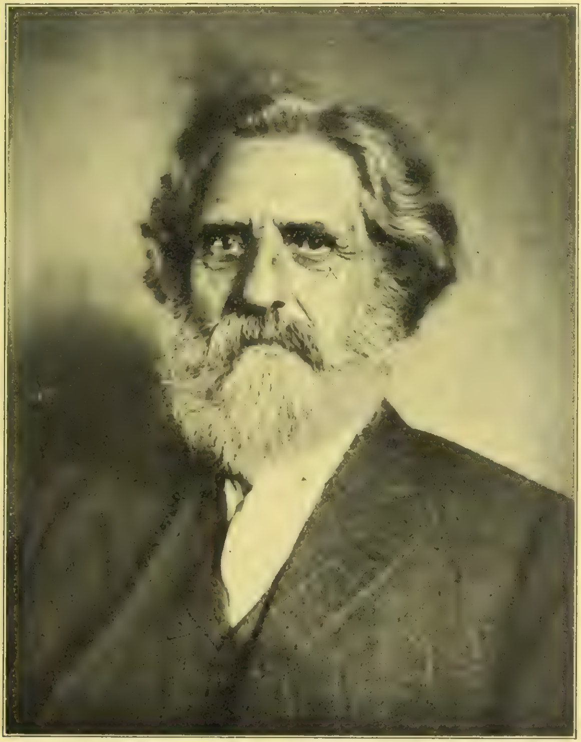
HENRY JACQUES GARRIGUES, A. M., M. D.

Born June 6, 1831. Died July 7, 1913.

Henry J. Garrigues was born in Copenhagen June 6, 1831 and died at Tryon, North Carolina, on July 7, 1913, in the beginning of his eighty-third year. He received his first degree, that of A. B., from the Metropolitan College of Copenhagen, in 1850, and the degree of A. M. in 1863. He graduated in medicine from the

PLATE I

AMERICAN JOURNAL OF OBSTETRICS
AND
DISEASES OF WOMEN AND CHILDREN
OCTOBER, 1913



HENRY JACQUES GARRIGUES, A. M., M. D.

University of Copenhagen in 1869 when thirty-eight years old. A year before this time he married Louise Riemer. In 1875 Dr. Garrigues came tó America and settled in New York City where he remained until his retirement from practice.

His first appointment in New York City was as Gynecologist to the German Dispensary, 1879, next Obstetric Surgean to the New York Maternity Hospital in 1881. He was made Attending Physician to the New York Infant Asylum in 1884, Gynecologist to the German Hospital in 1885, Professor of Obstetrics at the New York Post-graduate Medical School and Hospital in 1886, Gynecologist to St. Marks Hospital in 1890, Consulting Surgeon to the New York Maternity Hospital in 1892, Professor of Gynecology and Obstetrics, School of Clinical Medicine, in 1895, Consulting Physician Mother's Home and Maternal Hospital in 1897, Consulting Gynecologist to St. Mark's Hospital in 1904, Member of the Board of Physicians to the German Dispensary in 1903. In 1901 he was made an Honorary Fellow of the American Gynecological Society, and in 1902 an Honorary Fellow of the Obstetrical Society of Edinburgh. He was the author of several books, of which the best known are Diagnosis of Ovarian Cysts, published in 1882; Practical Guide to Antiseptic Midwifery, 1886; Text-book of Diseases of Women, 1894, 1897, and 1900; Text-book of Obstetrics, 1902, 1907; Medical and Surgical Gynecology, 1905. Besides these he wrote Gastroelytrotomy, 1878; Development of Female Genitals and Malformation of Female Genitals (in System of Gyn. by Amer. Authors) 1887; Puerperal Infection and Diseases of the Breasts in System of Obstetrics, 1889, and was a voluminous writer in the medical journals.

Dr. Garrigues' greatest work and that which will cause his name to be long remembered was the introduction of a rational antisepsis into obstetric practice.

In 1883, while the bulk of the profession held more or less to the idea that puerperal fever was essentially a septic process, a wound infection, as had been taught by Holmes and Semmelweiss, there was much concerning the exact nature of the poison that was vague, for the science of bacteriology was yet young and the old idea of a specific fever hard to overcome. Outbreaks of puerperal fever still were frequent and there were many who yet believed in the "epidemic influence of the air." But the time and opportunity were waiting for him who should have the insight and courage to replace the ancient dogmas of the established order by the new ideal of surgical cleanliness.

In the first nine months of 1883, out of 345 women delivered at the New York Maternity Hospital thirty died and the serious morbidity was enormous. In the month of September one in four of the women died and the others escaped only with their lives. At this time Garrigues came in charge and in the face of considerable ridicule formulated and carried out a detailed plan for driving out the pestilence. This plan was original in its detail, showed a broad comprehension of the principles of asepsis, was brilliant in achievement and proved to be of far-reaching influence on the practice of obstetrics.

Less than three months later Garrigues, in reporting the result of his work, was able to say: "The effect of the treatment has been wonderful. Ninety-seven women have been delivered since its introduction and not only has none of them died but there has been scarcely any disease among them. Only three have had any rise of temperature."

Could there be a greater triumph than this? The lesson was well taught and has not been forgotten. The world has ever held him the hero who has led victorious armies in triumph across fields strewed with dead and dying men. Is he less worthy to be called a hero who has led victorious against the legions of Death?

Dr. Garrigues was a man of simple habits and one who had in large measure those qualities of truth, courage and simplicity which, while seldom leading to great material success, give to their fortunate possessor the power to look life in the eyes with clear, unswerving gaze and to accept calmly whatever of pleasure or of pain may fall to him. Now, after a long and honored life he lies beneath the grass in the shade of the hills about the little town of Tryon, and above him the marble bears witness to the fact that "On October first, 1883, he introduced Antiseptic Obstetrics in America."

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of May 13, 1913.

The President, Samuel M. Bricker M. D., *in the Chair.*

Dr. S. Wiener presented a paper on

PROLONGED AMENORRHEA WITH BILATERAL OVARIAN DERMOID CYSTS.*

DISCUSSION.

Dr. Boldt.—As long as there is functional ovarian stroma, there is no amenorrhea, but the fact that in this case such stroma was not present would tend to show that it was destroyed and therefore the amenorrhea.

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*For original article see page 683.

Dr. Furniss.—I recall a patient with a unilateral dermoid, who for three months had amenorrhea. She was operated on and presented the same symptom for one year following. On examination I found her to be suffering from a severe anemia and I believe her amenorrhea can be accounted for on that ground.

Dr. Grad.—I also recall the case of a patient who for two months had amenorrhea. On examination I found a retroverted uterus and a mass in the pelvis, which at first I thought was an ectopic, but careful examination did not bear out the diagnosis. The abdomen was opened and a cyst of the ovary found. After its removal the menses became normal.

Dr. Coe.—I agree with Dr. Boldt's remarks in reference to the destruction of ovarian stroma causing amenorrhea. In such cases, one should strongly suspect possible malignancy. The same condition of affairs may be observed in tuberculosis in this locality. Here the ovarian stroma is also destroyed with resultant loss of function of the ovarian tissue, and consequent amenorrhea.

Dr. F. J. Boldt presented several specimens.

MYOMATOUS UTERUS WITH CARCINOMATOUS CHANGES.

Since *x* ray therapy is beginning to have such prominent place, particularly in Germany and in France, in the treatment of bleeding myofibromatous tumors, it seems to me that a word of caution is not out of place. The special indication for such treatment, as given by its strongest advocates, is: "In cases of women who are forty years old or over."

The specimen here shown is from a woman fifty-one years of age, who had one child twenty years previously. Menstruation began at the age of thirteen years, had always been at regular intervals of four weeks and always profuse. During the past two years the intervals were irregular, occasionally the flow omitted three months. At present the patient has been bleeding four weeks, very profusely. A myoma was diagnosed also by other physicians, but a surgical intervention was strongly advised against.

The tumor, as may be seen, was not large, nor did it seem to have any complications; it was freely movable. But because of evidence of cardiac changes, which I associated with the tumor, its removal was advised, particularly, since it is an impossibility to negate a malignant change, even in the apparently most favorable case. The evidence of the cardiac changes mentioned, consisted of a weak, slightly irregular pulse; a painful area upon pressure at the second and at the fourth sterno intercostal space, and at the apex.

A supravaginal hysterectomy was done. When the report from the pathologist was returned, I was somewhat surprised that adenocarcinoma was found present. Since the cervix had not been removed by me, I made the request that the specimen be gone over again very carefully. This was done, the pathologist spending much time over the specimen. His report was that numerous areas of unmistakable carcinoma are present. The cervix was then removed by vaginal extirpation. This showed freedom of malignant changes.

Considering that a recent review of myomatous tumors of the uterus, removed at the University *Frauenklinik* of Berlin, 10 per cent. showed the presence of malignant changes, one should hesitate, in the case of uterine neoplasms, and weigh very carefully the circumstances, before resorting to x-ray therapy in preference to a surgical intervention. Indeed, in the case of patients beyond the age of forty years, I, at the present time, would take the opposite view to that expressed by the advocates of x-ray treatment, and subject such patients rather to a hysterectomy. While it is conceded by enthusiasts of that treatment, at least by some of them, that, if the bleeding does not soon cease, to then do a hysterectomy, yet that means so much time lost. And, since the mortality from operation is so low as it is with good technic—not more than about 2 per cent. in uncomplicated cases—that should be the method of choice, unless the patient is opposed to it. The only feature that should also be taken into consideration is the risk of a subsequent hernia, and this, with a proper technic of closing the abdominal wound, is also insignificant.

LARGE MYOFIBROMATOUS UTERUS REMOVED SEVEN YEARS AFTER A MYOMECTOMY.

Mrs. C. W., now forty years old, had a myoma removed by me, nearly as large as the present tumor, seven years ago. She had a child since then. The present tumor gave much inconvenience because of its weight, and, during the past year, caused profuse bleeding at the menstrual periods. Since it is more risky, as to life, to do a myomectomy, than a hysterectomy, particularly when a large and ragged woundbed is left, and also, because it is not likely that we see all the small myomatous nodules in a uterus, I have departed more and more, during the past few years, from doing myomectomies, except in pedunculated tumors. As a rule, I prefer to do a hysterectomy, leaving, if the patient is young, a good part of the lower segment of the uterus and the ovaries, if fairly normal, for the purpose of retaining menstruation, in which I have succeeded in every instance in which such technic was resorted to.

MYOMA UTERI, WITH PYOSALPINX AND HYDROSALPINX, AND CATARRHAL APPENDICITIS.

The specimen was removed by abdominal hysterectomy from a patient thirty-eight years old who had never been pregnant. It was thought that it was a specimen of adenomyoma, but as the accompanying report shows, there was no foundation for this belief.

Specimen is a mass including uterus and appendages. One Fallopian tube is dilated into a sausage-shaped mass. Diameter of uterine end, 3 cm.; of distal end, 4 cm.; length 8 cm. Circumference at distal end, 11 cm. Surface rough with fibrin and adhesions. Tube appears sacculated. Thickness of wall 1 to 2 mm. Contents, yellow pus with fresh leukocytes. No gonococci found. Contents of proximal end, thick, gelatinous material. The other tube and ovary are shrunken, twisted, bound down with a mass of adhesions, both ovaries in a condition of fibrocystic oöphoritis. Much sclerosed. Uterus is enlarged 13×8×8 cm. Cut section (longitudinal) shows one large fibromyoma size of a baseball, subperitoneal 8×8 cm. At the fundus are smaller masses.

Microscopical examination shows no areas that suggest any malignant degeneration. Endometrium thickened.

DISCUSSION.

DR. MALLET.—At least two expert radiographers have informed me of the great results they have been getting by the use of the *x*-ray to check hemorrhage and diminish the growths, but until I hear that the results are confirmed I will not try it. In regard to myomectomy, as Dr. Brettauer says, it depends on the age of the woman as to whether one would do a conservative operation and take the chance of recurrence or do the radical procedure.

DR. TAYLOR.—In regard to Dr. Boldt's case, to my mind, the strongest argument against the use of *x*-ray is that the danger of malignancy is greater than the operation with removal of the fibroids.

Certain laboratories will report malignancy in fibroids, where others will not, both doing conscientious work. This was well brought out in Berlin last summer where one of the men there advised *x*-ray treatment for fibroids, although his statistics showed 5 per cent. to 8 per cent. of malignant degeneration in these cases, a much higher record than elsewhere, and still he used the Röntgen-ray treatment.

As regards the case where a hysterectomy followed a myomectomy seven years before, it seems strange to me how few recurrences we really get. I cannot recall any presented before this society. I have seen it, though rarely, either in my own cases or in the cases of others. It appears to me that Dr. Boldt's case is by no means a strong argument against the performance of a myomectomy.

PHYSIOLOGICAL VERSUS ANATOMICAL RESULTS FOLLOWING GYNECOLOGICAL OPERATIONS.

When asked by our Secretary to read a paper at this meeting, I accepted with the proviso that I be permitted to present for discussion a subject which I had already used in a former paper read before another society, and that much of that paper would be embodied in this one. I make no apologies on this account, for it has seemed to be a subject which should interest us all.

For twenty-five years I have had the opportunity of watching the results of operations of others and myself and I wish to present to you a few observations I have noted along the line indicated by my subject.

For many years I have been convinced that the man who was able to see the after-results of his operative treatment of gynecological patients, would tend to become more and more conservative. I feel certain that every man in this room has more respect for the wonderful curvative powers of old dame Nature than he did when first he began to practise his profession. He notes her marvellous reparative power at times under seemingly impossible difficulties. With the wonderfully improved surgical technic over former years which has enabled us all to render our death rate so low after major operations and with increased skill by reason of experience, are we not liable at times to pay too much attention to anatomical and too little to physiological cures?

The young and oftentimes the more experienced operator correctly diagnoses the condition of double tuboovarian abscess and with only the thought in his mind that he must remove organs that are supposed to be anatomically destroyed by disease and totally unmindful that these ovaries have been perfectly able to keep up their physiological functions, boldly takes out both tubes and ovaries and oftentimes the uterus, triumphantly exhibits them at a medical society and with pride tells his patient she is now well.

Or again, the case may be that of a fibroid tumor and with equal zeal a panhysterotomy is performed. Yet again, after several properly performed curettages for profuse menstruation with *no benefit* a complete hysterotomy is done.

What of the woman?

Let me draw in a few words her picture. A nervous wreck, a neurasthenic, with all that that word implies, to a greater or less degree. With hot flashes in the winter and cold ones in the summer, she suddenly develops a matronly appearance, with increased adipose tissue. Rapid senile changes take place in the vagina and all the symptoms of senile vaginitis, frequent and painful urination, makes her go from one physician to another until at length she settles into a state of semi-invalidism with a perverted mental attitude—knowing that she is different from her sister, she becomes the confirmed victim of hypersensitiveness.

What of her home history?

Often she is incapable of the sexual duties of the wife, except with such pain that the husband ceases his relations out of consideration for her. We know full well what many a man does under such circumstances. Unmindful of his marraige vows and justifying his conscience by the thought that it is to save his wife pain, he seeks new pastures, forgetting that his boyhood's gonorrhea possibly has been the cause of her invalidism. How many families have seen happiness fly out of their homes after such anatomical cures?

We as surgeons cannot wholly shirk the responsibility of having not infrequently helped to wreck this life and home. I am not drawing an exceptional picture. There is probably not a man present who has not seen just such a case and who does not dread to see such a patient walk into his consultation room, for he knows only too well how little he can do to benefit her.

It has been said that the greatest actuating instinctive desire on the part of man is "to get and beget." "To get" what he can of this world's comforts and "to beget" his kind. With equal truth can it be said of the woman that her strongest instinct is "to have and to hold." To be able "to have" a child and "to hold" it to her breast.

How many surgeons ever stop to think that the removal of the woman's ovaries has practically the same physiological result on her being as castration would on that of a male? We are certainly very ignorant of the mysterious influence of the so-called ovarian secretions and many of us have been more than discouraged by the poor results to be obtained from the various ovarian extracts on the market.

What results may be obtained from the newer corpus-luteum extract remain to be seen. In the meantime, I want to put in my plea for the retention of enough of the female pelvic organs to permit the woman to be a woman.

In two women whom I personally confined afterward have I, through a posterior section of the vagina, opened and drained pus tubes. I desire to present a very brief history of these cases.

The first was a woman who gave the history of a recent gonorrheal infection resulting in a double pyosalpinx. Sending her to the General Memorial Hospital, I opened the culdesac of Douglas through the posterior vault of the vagina, opened both tubes, evacuated the pus and established drainage. An uneventful recovery followed. Eight months later she came to me with a recurrence of the condition on the left side and again was treated in the same way. One year later, following a prolonged horseback ride while menstruating, there was a double recurrence of her old condition. This time I determined to open the tubes from one end to the other. Through the opening in the culdesac I exposed first the right and then the left tube, opened each completely and with gauze packed in their cavities, I drained as before. Two years later I confined her of a normal child and she made an uneventful recovery.

The second case, a young woman of twenty-nine, gave me the following history: at the age of seventeen while living in the West, she had her left tube and ovary removed, for what her surgeon told her was cystic degeneration of the ovary. She married at twenty-eight and a year later became pregnant. Not wishing to have a child at this time she placed herself in the hands of an abortionist. This man succeeded in producing an incomplete abortion which was followed by a septic endometritis. I cleaned out the foul secundines from the septic uterus and was happy to see a temperature of 104 degrees drop to normal in a very few hours. An uneventful recovery was apparently in progress until the eighth day after the curettage. Pain in the right ovarian region and a slight rise of temperature indicated more trouble. In two or three days the right and only remaining tube was the site of an abscess. Vaginal section enabled me to verify the statement of the patient in regard to the absence of the left tube and ovary, after which I opened the right tube for almost its entire length, wiped out the pus and packed gauze in its cavity. Within six months this patient was pregnant and on the 26th of May, 1910, I confined her of a female child. Fifteen months later I confined her of a male child. In both instances the pregnancy and puerperium were uneventful.

I do not claim that one is to expect such a result after the opening of pus tubes, but the very fact that I have had two such results will show how much nature will do to restore organs to their normal condition when her efforts of freeing the subject from sepsis have been aided. In many instances vaginal drainage of pus tubes will have to be repeated as was done in the first case. There will still be some cases where the infection is so diffuse that it will be necessary to do a laparotomy in order that pus cavities may be more radically dealt with. Even here there should be very few cases where enough of healthy ovarian tissue cannot be left to keep up menstruation, mental equilibrium and the sexual functions. Suppose it is necessary to drain per vaginam more than once, if the result obtained is so much more to be desired—done under proper precautions by one who has had even a moderate experience, the risk to life is practically nil, and the physiological cure is almost certain.

I can imagine some critic will say that I only see the good results after such operations, the others discouraged go to some other surgeon. In some cases this is doubtless true, but I have been able to follow enough of these patients to know that far fewer seek help elsewhere than those poor "female eunuchs" who go from surgeon to surgeon seeking relief they cannot find. The removal of a fibroid uterus with the tubes and ovaries is far easier than it is to remove the fibroid tumor or tumors and build up a new uterus from tissues that remain, leaving one or both tubes and ovaries. While as stated above the work is distinctly more difficult, the result is a hundred fold more to be desired.

Nor do I mean the simple enucleation of small senile or pedunculated fibroid nodules, but the removal of large fibroids often times necessitating the opening of the endometrium with practically reconstructing the uterus. In one instance only the endometrium of the lower third of the uterus was left intact, yet this patient has continued to menstruate regularly for a period of six years. That the function of menstruation should continue is greatly to be desired. Only recently I listened to a well-known gynecologist in this city, who said that for his part he saw no reason to make an effort to keep up a function which made the woman feel more or less miserable each month.

His experience and mine have certainly been different. Tell a woman in the late twenties or early thirties that she is entering a premature menopause and will soon cease to menstruate, and see how she will plead to have this function prolonged.

The removal of the uterus in young women has been performed for what seemed to be uncontrollable hemorrhage. I am thoroughly convinced that such an operation is rarely justifiable since the condition can be controlled in the less severe cases by the ligation of the uterine arteries and in the more aggravated, by removing a wedge-shaped piece from the fundus of the uterus. So far as I know this latter procedure was first suggested by Howard Kelly and I want to add my testimony to that of his, that it is a most efficient operation.

Naturally I do not refer to cases of malignancy but to those fortunately rare cases of menorrhagia the etiological origin of which is still in doubt. In place of condemning these patients to live the unnatural life of a sexless creature, they may be restored to perfect health and normal functions. The younger the woman the more certainly is she distorted physically, mentally and sexually by the removal of her ovaries.

In conclusion, I again wish to put in my plea for conservative gynecology, remembering that we are dealing with a woman as well as a patient, and that the preservation of her sexual functions may and often does mean her future usefulness, as a woman, mother and wife.

Dr. Vineberg.—We must all agree with the stand taken by Dr. Jarman in his paper, that the more cases we see the more convinced we are of the necessity for young women to retain their reproductive function. My experience with pus tubes has not been as favorable as that of Dr. Jarman. I can recall no case where sooner or later it did not become necessary to open the abdomen. As skillful an operator as Dr. Krug of Mt. Sinai (he is here and can tell you so himself), tried it and in spite of it, many came back for a second operation and finally for a radical operation. I believe that one should always make an attempt to cure without a radical operation but my own experience, if one is to get a successful result, points the other way. Often when the radical follows the palliative operation, one can see on opening the abdomen that the vagina had previously been opened in such a manner that pus outside the tube had been cut into and at operation one may find a tube filled with pus and not opened at all.

I agree with Dr. Jarman that if ovarian and uterine tissue can be conserved, it should be done. For fibroids the conservative operation should be carried out. I had a few cases where I could enucleate the fibroid vaginally, by splitting open the uterus, in one of these the tumor mass being the size of a cocoanut, the woman later became pregnant, went to term and was delivered in a perfectly normal manner. Six or seven years after, she again conceived and as before had no trouble. I have three or four such cases with similar results, although the tumors were not so large. In no case can I see the sense of removing the uterus and leaving the ovaries behind. I can recall one such case where later a cyst of the ovary developed calling for operation which was difficult in the extreme. I also remember another case which two months after the operation developed a cyst of the ovary left behind. Where one must remove the entire uterus, therefore, I do not believe the ovaries should be left behind.

Dr. Coe.—Very few gentlemen here to-night recall the time when indiscriminate removal of the ovary was practised even for simple prolapse and it was a very conservative man who did not remove the other. These ovaries were then proudly exhibited at a meeting of this society. I can recall many cases in which double oophorectomy was done for a few small cysts in the ovaries. Their removal was often followed by extremely distressing symptoms, and I have come to the conclusion that if the ovary is fairly normal it should be left intact and not be tinkered with. I have had many severe cases that have led me to conclude that we should beware of ultra-conservatism. Dr. Vineberg's point about not finding the tube at all per vaginam is well taken.

Gentlemen, the subject is not new and if you have seen the same amount of indiscriminate ovariectomy that I have, you will agree with me that the ovary is to be spared, not because of the possibilities of the later conception (2 per cent. to 3 per cent. is a large estimate), but because of the retention of the menstrual function. Often with a pyosalpinx a normal ovary can be dug out, in which case it should be conserved. Do not, like some of the older gynecologists, remove everything and examine afterward. Also do not push conservatism too far. Many ovaries which are left become adherent, painful and give symptoms.

Dr. Healy.—I am interested in the question of the removal of ovaries. When doing a supravaginal hysterectomy in a woman over forty, unless the ovaries are very normal, they should be removed. In women under forty, with marked nervous symptoms, one ovary should be preserved if possible.

About three years ago one of our members operated on a woman forty-seven years of age leaving both ovaries behind and in two years she had bilateral papillary cyst adenomata, which broke into the surrounding tissues and the patient died. Therefore at forty or over when removing the uterus, one should also remove the ovaries to prevent succeeding malignancy, unless they seem to be quite normal in every respect.

Dr. Mallett.—I agree with Dr. Jarman. My experience with pus tubes has been almost similar to his and I believe in all these cases wherever possible, drainage of the tubes through the vagina should be performed.

Dr. Taylor.—One advantage in posterior drainage has not thus far been brought out, although I am sure that Dr. Jarman had it in mind. A vaginal incision for pyosalpinx carries with it hardly any risk, even if the patient needs an abdominal operation later on the risk is less than if no posterior vaginal section had been done. The drainage has removed much of the pus, the inflammatory condition is improved and there is greater opportunity for conservative work on the appendages if it is necessary.

Dr. Jarman.—The question about really opening the tubes? I never had any trouble in doing this. A broad incision should be made and the tube pulled down. This I have often done with an ordinary spongeholder, and now is the time to look at the tube.

There are no questions in my paper about uterine removal and doing an ovariectomy with it. My plea is to remove as little of the uterus as possible and to conserve the woman's physiological function and to leave her at least as well as we found her. To accomplish this purpose best vaginal operation as stated by Dr. Taylor is the operation of choice.

Dr. Coe.—Mr. Chairman, if I am not out of order, I would like to ask the members present if they have had any cases of carcinomatous degeneration of the cervix after supravaginal hysterectomy? I have recently had my first case.

Dr. Grad.—I would like to inform Dr. Coe that we had one such case at the Woman's Hospital.

Dr. Davis.—We had one such case where the patient had a fibroid was operated and in eight months developed malignant changes.

Dr. King.—In my experience I only remember one such case. not my own. In one and one-half years, malignancy developed and I believe this may be attributed to the fact that the cervix was not absolutely normal at the time of the operation.

Dr. Vineberg.—I can recall two such cases, the first with a pelvic abscess. Here we could not get the tube down. The woman was operated on twice, per vagina and then by the abdominal route. The cervix was left, six months later it became malignant and death followed.

Last week I had a patient who had an operation at Buffalo two years ago; now she has a carcinoma of the cervix. The operation was done by Dr. Mann of Buffalo and presumably for a fibroid tumor of the uterus.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

Meeting of May 15, 1913.

The President, William M. Polk, M. D., *in the Chair.*

The evening was devoted to a

SYMPOSIUM ON CANCER. CANCER RESEARCH INSTITUTE.

Dr. J. C. Adami, Montreal, Canada, emphasized the fact that the primary object of cancer research was the discovery, not of the cause of malignant newgrowth, but the means whereby humanity might be protected against this awful scourge. Keeping this in mind it would be seen that there were two methods of attacking the problem, both logical and scientific, and it was for his hearers to determine which promised the better results. These were the direct and the indirect methods. Of the former Ehrlich had afforded a unique and triumphant demonstration in his discovery of salvarsan. This method of research might be most laborious, hundreds of compounds having to be devised, tested, and rejected, but it was a reasonable expectation that gradually certain groups of radicals would be encountered presenting definite specific action upon one or other phase of the particular morbid process, and that eventually some combinations of such substances would be discovered which would definitely destroy the causative agent within the tissues, or arrest the morbid process without coincident grave injury to the tissues of the individual. This was the method that was being followed by Wassermann and his coadjutors and that with a certain measure of reported success as regarded the cancer of animals of the laboratories. It was a purely therapeutical method, even if at the same time purely experimental. It was by means of the indirect method that scientific medicine in their generation had scored its most noted successes. It was the method based on the old Baconian aphorism "Vere scire est per causas scire"; this was the etiological method. The treatment and control of tuberculosis, diphtheria, and other infections during the past thirty years dated from the moment at which the causative agents were determined, or failing that (as was the case of yellow fever) dated from the time when employing rigid analogy, the nature of the disease became realized; that is the detection of the cause threw light upon the mode of prevention of an allied disease. Even in Ehrlich's hands the direct method could not have succeeded but for the previous discovery of the causative agent of syphilis. Applied to cancer he had grave doubts whether the "Ehrlich method" could promise anything of the nature of a full control of the situation. It seemed to him that the majority of scientific workers must be with him when he made the proposition that the indirect method must be that which should be selected and that ideal cancer research must approach the solution of the problem by investigation into the nature of the process of normal tissue growth, into the life history of malignant growths, and so into the cause or causes of neoplasms. Admitted that an Institute along the latter lines would be the better and also admitted that despite the labors of generations of investigators the cause of cancer was still undetermined, how were they to proceed? The energies of the institute must not be devoted to immediate endeavors to determine the cause but the position had to be invested from all sides and thoroughly undermined. It was better for an institute to concentrate on one line of attack, though this required no little strength of mind with the full knowledge that it might very possibly turn out to be futile. Cancer research to be well conducted necessitated heavy expenditure, so heavy that the institute was most likely to be of service if it took up one or at most two lines of work. As instances of such concentration of effort might be mentioned the work of the Imperial Institute for Cancer Research in London, which had done valuable work by the accumulation of statistics of cancer incidence in different parts of the world, or that of the Ehrlich laboratory devoting itself to the transplantation of tumors in the lower animals. If Dr. Gaylord and his associates had failed to discover the causative agent of cancer they had done yeoman service by the method of exclusion. As a result of such work they had a much fuller knowledge of very many aspects of the problem than they had ten years ago; they were in a position to direct their efforts far more methodically and more serviceably than at any previous period.. If, however, there were abundant funds the ideal institute would be in such a center as this where there were abundant research workers in the various branches of biology and where experts of all orders might be gathered to make a combined attack from many sides. The plan outlined by Columbia College under the Crocker bequest seemed to him admirable, though he was not acquainted with it in all its details. His ideal of a cancer research in a great and wealthy city in Harvard was termed a "commission." There must be a central institute or administration, which should contain a library where was collected all modern literature bearing on cancer research, a Director's office, and a suite of laboratories and animal rooms for the use of those making investigations under the immediate direction of the head of the institute. There should be a conference chamber for, in his opinion, informal conferences had a great value. It was by combined effort that success was most likely to be attained, where individuals were working for the reputation of the institute and for the good of humanity and not for their own glory and advancement. The development of this èsprit de corps depended essentially upon the influence of the head of the institute. A desideratum of equal value was a hospital or certain wards in a hospital already existing. Failing this there was danger that the work would become too academic, too remote from practical needs. In such hospitals which afforded means for the treatment of patients it must be laid down that in return the families must consent in case of death to a postmortem examination. Beyond these two central sections there was no need to duplicate special laboratories in physics, chemistry, physiology, cytology and general biology, pharmacology and experimental therapeutics. Where these were present it was both economical and practical to use them to the fullest. Make the heads of such laboratories members of the executive of the institute and develop the spirit of cooperation so that there might be free consultation between the members of the executive. Let these laboratories be thrown open to those willing and anxious to conduct investigations along any particular line under the direction of the head of each laboratory, the maintenance of the investigators and the cost of the investigation being paid by the institute. Let the work thus done be brought together and focussed by the periodical conferences already referred to. All this depended upon the spirit in which the work was entered into, and above all things on the spirit and enthusiasm of the director.

CANCER STATISTICS.

Mr. Walter F. Willcox summarized the arguments of Messrs. King and Newsholme in their notable paper written in 1893 supporting the conclusion that "the increase in cancer is only apparent and not real," outlined the objections that had been raised to this conclusion; called attention to the large body of new evidence on the subject which has accumulated in the intervening twenty years, especially that to be found in the international summaries published by the French government in 1907 and by the Amsterdam statistical bureau in 1911–12 and in the annual Mortality Statistics of the registration area of the United States, 1900–1911. After analyzing this and other evidence he concluded:

Probably the larger part of the increase and possibly all the increase in the mortality from cancer is apparent rather than real.

Those who doubt this conclusion and hold that most of the increase is real may interpret the evidence as showing that the real increase is not at a geometrical or even an arithmetical rate but diminishes as the death rate from cancer rises and that perhaps in certain limited areas, like Switzerland and a few cities, it is already approaching its maximum.

PUBLIC EDUCATION IN CANCER.

Dr. Willy Meyer said he would approach his part of the symposium, public education in cancer, from the standpoint of the general surgeon. There were three questions of importance, viz., What was the cause of cancer? Was cancer infectious or contagious, or both? Was cancer curable? These were the questions which were continually placed before the general surgeon by patients and those with whom he was called in consultation.

I. What was the cause of cancer? He did not think that this was the time or the place to consider this, still the question had some bearing on the subject of public education in cancer. It was an interesting fact that pathologists in discussing this problem were absolutely opposed to the theory of the cause of cancer being due to a microorganism, whereas many general surgeons had by direct observation come to this conclusion. Plain logical thinking in the examination of patients could hardly make one think otherwise than that the cause of cancer was a living organism. Take, for instance, tumor of the breast, there was not one typical symptom that was suggestive of carcinoma, nor pointed to a benign tumor. The differential diagnosis lay between tuberculosis, syphilis, and actinomycosis. They could diagnose tuberculosis, as a rule, by the tubercle bacilli in the sputum; also actinomycosis could be diagnosed by the actinomycoses bovis, syphilis by the spirochetæ, all living organisms.

Why should a tumor of this kind, which proved to be carcinoma, have an origin of an entirely different character? Dr. Meyer asked that he be permitted to report two observations that had some bearing on this question. In the early nineties the treatment by the injection of methylviolets, particularly fuchsine, was in vogue in patients suffering from inoperable cancer. In one patient with an inoperable carcinoma after amputation of the breast, this treatment was carried out. She returned later saying that she had an itching sensation over the entire region of the breast. On removing the dressings he found a condition which ordinarily would be diagnosed as an acute eczema. There were innumerable small elevations near the area that had been injected. The further observation of this case showed the development of small carcinomata. He could find no cause or any explanation of this unless it was that he injected the fuchsine into a nest of local carcinoma, liberating something which was carried by a local artery into the adjacent field in the shape of multiple emboli as in miliary tuberculosis. This something could hardly have been cells. There could not have been any visible multiplication of these elevations within twenty-four hours. Not long ago Dr. Meyer was called upon to operate upon a patient who seemed to have tuberculosis of the peritoneum, all the symptoms of this condition being presented. He operated and found a large amount of fluid in the peritoneal cavity and the typical signs of tuberculosis with the one exception that the minute nodules appeared somewhat more solid than in tuberculosis. A portion of the omentum was excised and he was very much surprised at the pathologist's report, miliary carcinosis. The clinical signs of carcinoma in this case so closely resembled those of tuberculosis that he was confused in his diagnosis. He could not imagine any other cause of carcinoma than a living microorganism and he thought that this would be found sometime in the future. If cancer was due to some other cause, biological, chemical or otherwise, why should it happen that after a primary early excision of a cancer, apparently curing the patient, with the same cause persisting, the tumor did not promptly reappear. Many surgeons had come to this conclusion. He said he was very much interested in the report of Professor George Klemperer of Berlin who also believed that some living organism would be found to be the cause of carcinoma. He said they should just keep on searching until they found it. He thought it of great importance that the pubic should be taught, and be made to understand, that progress was being made in their search for the cause of cancer; immense progress had been made in cancer as had been made in tuberculosis by Kock, and in the discovery of the spirochetæ pallida. Their great trouble with reference to cancer was in the fact that they had no money, no endowment fund. The men abroad were working with this end in view; in England and in Germany they had a million of dollars for this work on cancer. There would be without doubt rapid progress made in learning the cause of cancer.

II. Was cancer infectious, contagious or both? This was the second and very important question usually put to the doctor by the patients. One had never seen nor heard of a patient afflicted with the disease to convey it to his wife. Nor did they ever hear of a nurse caring for a patient with carcinoma ever becoming afflicted with the disease. Dr. Meyer had never heard of a surgeon who, for instance, had injured his finger during the performance of some operation on a cancerous subject, ever developing cancer. It did not appear that cancer could be conveyed from one person to another in this way and, therefore, the disease could not be considered infectious. An observation he had made was perhaps of some interest, even though slight. He had operated upon a patient years ago for large papillomata of the bladder, cancerous at the base, by suprapubic cystotomy. The disease recurred. The cystoscope showed an involvement of the prostate gland, and the patient was again operated upon and the bladder had to be left open. During the time of after-treatment he was called to examine the wife and he found she had a carcinoma of the cervix and died one year later. This was an interesting case to him and one which he often had in mind, although he was unable to state positively that the disease was conveyed from one to the other.

III. Was cancer curable? This third question was always primarily in the patient's mind and he was glad that he could answer this question in the affirmative, Yes. Cancer was curable by the surgeon's knife if the growth was radically removed at an early stage. The whole question resolved itself into early diagnosis and early operation. They all knew the clinical aspects in the development of the three stages.

(a) It was an entirely local disease.

(b) It was a local disease with the regionary lymph nodes involved.

(c) There were metastases.

They had all seen that if the cases were diagnosed in time, many of such patients could be cured by operation and absolutely cured. They also had had many observations that cancer in the secondary stage had been cured.

Dr. Meyer wished to call special attention to cases of cancer of the breast; many times had he been called upon to operate on such cases when there was far reaching involvement of the axillary glands as well as the infraclavicular glands. Yet these cases, if treated radically, in from 40 to 50 per cent. of the cases, had lived and been under observation for five years and longer. Observations by Werthheim of 500 cases of cancer of the uterus showed more than 40 per cent. cures. The personal statistics of Kocher in resection of the stomach for carcinoma showed 20 per cent. permanent cures. And so it went. It showed from their statistics that they were not only able by means of the knife to cure carcinoma in the first, but in the second, stage. For the after-treatment they were greatly helped by the *x*-ray, serum treatment, etc. Therefore, the whole question resolved itself into early diagnosis and early operation. It seemed to Dr. Meyer that it was absolutely necessary to educate not only the public but also the profession in these questions. Undergraduate as well as postgraduate students ought to be taught the importance of an early diagnosis of cancer and its management in special classes so that they should bear in mind certain symptoms that made these cases suspicious. As one instance he called attention to blood in the urine, vaginal or rectal discharges. The fact that blood was found in the urine, as a symptomless hematuria, was very important and should always create the suspicion of carcinoma of the kidney. These suspicious cases should be promptly and as early as possible submitted to a cystoscopic examination, especially during the time of the hematuria in order to determine the affected side. The same thing held good in the diagnosis of a cancer of the uterus. If there was a bloody discharge from the vagina, especially after the time of the menopause, there should be the suspicion of a beginning carcinoma. This also applied in bleeding from the rectum. This was so often forgotten by the busy general practitioner; if blood appeared in the stools, patient and doctor usually thought first of hemorrhoids. Even if these could not be excluded the individual should be subjected to a digital examination and rectoscopy. Cancer of the esophagus was most benign; the glands in the neighborhood were little involved and there occurred but little in the way of metastases. These patients came early to the doctor because of the difficulty in swallowing and this occurring many times day after day, was the reason that the doctor often had the opportunity of seeing patients with this complaint during the early stage of the disease. The fluoroscope, the *x*-ray, sounding with special instrument, esophagostopy were valuable adjuncts in the diagnosis of cancer of the esophagus and should be used for examination in such cases without delay. If the case was in doubt, the surgeon should go ahead and make an exploratory thoraxotomy, being prepared for radical work and so possibly save the patient. Dr. Meyer insisted upon teaching undergraduates and those in post-graduate schools the necessity of making an early diagnosis of these cases of carcinoma. Those who had lived through the times when there was so much discussion on appendicitis knew that patients frequently came nowadays and said "Take out my appendix." Such was the result of the education of the public in this matter. And the same should result from educating the people regarding carcinoma and the early symptoms of this disease. Of course, one should not always blame the general practitioner; many times there would occur carcinoma of the rectum, or of the pylorus, or other organs and when the general practitioner was consulted it would be too late. Much good was to come from the education of the public. Only to-day he saw a woman far advanced with cancer of the breast and she brought as an excuse that the tumor had never been painful. We know, that painless tumors of the breast are always very suspicious of being malignant. The public should be educated; they should be told that as soon as blood appeared in the urine, for instance, they should at once consult a doctor and insist upon a diagnosis. The same thing applied to a bloody discharge from the vagina or the rectum, and there were many other examples. It was hardly necessary to call the attention of this audience to how far advanced they were in their warfare against cancer and in educating the public. It was well known that there were various associations who had taken this matter in hand; committees had been formed for instance in New York for educating the public in this matter. A cancer campaign committee had been created by the Congress of Surgeons of North America last fall and so on, all working along the same lines and in the same direction. It could not be denied that the work that was already being done was a good one. According to the laws of medical ethics, it was hardly permissible for a doctor to write articles for the weekly or monthly magazines, still less for the daily press, in order to so educate the public. But it was a splendid idea and nicely possible for a man like Mr. S. Hopkins to publish in Collier's Weekly articles which tended to educate the public regarding cancer. Dr. Meyer said he was very much interested in hearing in a paper just read by Dr. Cullon of Baltimore how the daily papers had reprinted this article and that the doctor had received letters stating how the husband who had read this article had induced his wife affected with a tumor to consult her doctor at once; how another lady had told her husband to do the same. In closing his remarks Dr. Meyer said that they hoped to attain the same results and to save as many lives in patients afflicted with cancer by this general publicity campaign as they had succeeded in doing in those afflicted with tuberculosis.

DISCUSSION.

Dr. Robert Abbe said that they owed Professor Wilcox a debt of thanks for presenting more comforting statistics than any reviewer of the last decade. Those of Mr. Hoffman, Statistician of the Prudential Life Insurance Company, lately presented in Washington, were illustrative of the recent tendency to build up world statistics magnifying the numerical evidence of increase in the cancer plague. Professor Wilcox's analysis, however, based on smaller groups of well-selected statistics were more in keeping with his own personal observations. Dr. Abbe had felt that in spite of the greater number of cancer cases presenting themselves to the surgeon coming out of the dark, as it were, the memory of large surgical clinics of thirty years ago recalled about the same proportion of cancer cases as at present, which were the subject of clinical lectures. Professor Adami deserved their thanks for the "push" his address would give the work of the cancer research, to study more the cause of cancer than the treatment. Dr. Abbe said that he himself had worked more along the lines of treatment, especially local treatment. The remarks of Dr. Meyer that all tendency now in regard to the causation as microbic did not agree with the speaker's observations. The argument of analogy was offered, that "in considering a breast tumor one thought of four possibilities syphilis, tuberculosis, actincmycosis and cancer of which the first three were acknowledged to be microbic and it was probable that the fourth would be found to be." The fallacy of this was apparent when one showed that easily 95 per cent. of these tumors were disorders of the glandular structure of the breast wholly unlike any of the others. In addition one saw that Dr. Carrel's growth of cells *in vitro*, carrying on generation after generation of cell development in culture tubes, demonstrated that living cells were not microbes though they might act like them. A further and very strong argument against the microbic origin of cancer had developed in Dr. Abbe's mind in the fact that radium had a powerful influence on cancer cells, but not through its bactericidal action. The alpha rays emitted from radium were strongly bactericidal but the gamma were not so. All workers in radium knew that the alpha rays were only destructive of tissue as well as bacteria, brought in intimate contact; while the beta rays were stimulating and only the gamma rays were efficient in causing retrograde changes in malignant cells. Hence one must admit that cancers destroyed by radium where no access of alpha rays was permitted were altered by the nonbactericidal gamma rays which entirely altered their life course and rendered them inert and atrophied. After ten years study on radium in cancer work, it was now evident that men who had sneeringly criticized its beneficent action as limited to small superficial epitheliomas easily taken care of by other surgical means, must admit that as new evidence was accumulating to show that larger doses than had been hitherto available and new ideas about filtering out burning and stimulating rays by heavy load or distance filtration had demonstrated a greater efficiency on larger growths and gave promise of a broader field of usefulness. The effects of radium rays on seeds, whose vital force might be justly compared to that of animal cells demonstrated that seeds kept for a while close to radium were killed, those at a slight distance were stimulated, and at a greater range they were devitalized and grew with less and less vigor up to a certain distance in comparison with unradiumized seeds planted under similar conditions. This coincided with the results seen in tumors. The failures of radium to cure certain growths urged on the study of cause and effect. It is becoming evident that the use of small or weak doses of radium had been efficient, because of the lack of knowledge of filtration to obtain the more competent penetrating gamma rays in massive doses. This was shown in no better way than by the destruction of epitheliomas caused by the use of Röntgen rays stimulating the skin to develop cancer which the known rays of radium cured. This cure was not brought about by any action like cautery or caustic but by restoring to the aberrant cell growth some lost power of self control restoring it to normal lines of growth. It seemed to the speaker that even with the small amount of radium available to the surgeon such progress had been already made to apply this subtle and unique power as gave promise of increasing future value.

Dr. Greenough of the Harvard Cancer Research said that he was more interested in the surgical side of the cancer problem and that he was heartily in accord with what Dr. Meyer had stated regarding the treatment of cancer by surgical means. He confessed, however, that he could not accept the views stated by him regarding the etiology of this disease. There was no doubt but that the public should be educated to understand the meaning of early symptoms pointing to cancer; the general practitioner should be instructed in this matter as well. It was well known that a poor person who lived in a large city received good treatment; they were, as paupers, permitted to go to the best hospitals. The wealthier classes were also able to get the best care and treatment.

But the bulk of the population, those who lived in the country, had to depend on less good medical treatment and advice. Only yesterday Dr. Greenough operated upon a patient who had cancer of the breast. The patient was a woman, thirty-seven years of age, who noticed this tumor in her breast eight months before consulting him. It was not painful, but she was concerned because of its presence. She went to one of their general practitioners for advice and he said: "Does it pain you?" She replied in the negative and he said to her: "Let it alone until it does bother you." She continued along for a matter of six months and then the tumor began to pain her and she again consulted a physician who told her that it was very suspicious and that the only thing for her to do was to consent to have it taken out. The tumor was removed and the pathologist reported that it was a cancer of the breast.

Dr. Greenough believed personally in the education of the public and especially along the lines of the early symptoms of cancer. They should be educated also regarding the early symptoms of cancer of the stomach, nephromata, etc. The laiety should be instructed too to consult the surgeon, or family physician, whenever any tumor was noted. It was very important that they should be taught not to neglect this.

SECTION ON OBSTETRICS AND GYNECOLOGY.

Meeting of May 22, 1913.

GEO. G. WARD, JR., Md., *in the Chair.*

BENEFICIAL EFFECT OF RENAL DECAPSULATION AS SHOWN BY FUNCTIONAL TESTS BEFORE AND AFTER OPERATION.

DR. HENRY DAWSON FURNISS reported the case of a woman, married three years. Soon after marriage she had a plastic operation performed on both ovaries for a cystic condition by Dr. Babcock of Philadelphia. This was done under spinal anesthesia. Right after this she became pregnant and during the latter months of her pregnancy had a large amount of albumin in her urine. As she went into labor she began to have convulsions which numbered forty-one. After this she had loss of memory for about three months. Since then her general health had been poor; she was very anemic, she had headaches, the urine was constantly of low specific gravity. She skipped two periods; since missing the first she had felt worse and her headaches were more marked. Phenolsulphonaphthalein 0.6 was injected intravenously; 15 per cent. was eliminated in the first hour (14 ounces of urine being passed), and none in the second. Because of her previous history, the constant low specific gravity of her urine, the low elimination of the phenolsulphonaphthalein, and increase of headaches, it was decided to empty the uterus, which was done under gas-oxygen anesthesia. A curetment followed.

March 15, 1913. The patient made an uneventful recovery from the curetment. While in the hospital the K. I. test was given and 5 grams were eliminated in forty hours. Twenty c.c. of a 10 per cent. lactose injected intravenously was eliminated in four hours; phenolsulphonaphthalein, 6 mg., injected intravenously, 5 per cent. eliminated in the first hour, but only a trace in the second hour. The blood pressure was 135.

March 18, 1913. Dr. Miller reported that since the patient had been home she had suffered much from headaches and was very exhausted.

April 2, 1913. The patient had a great deal of headache and was quite weak and had not improved as she should have since the abortion. Phenolsulphonaphthalein, 6 mg., was injected intravenously. In the first hour 8 per cent. of this was eliminated, and none in the second hour.

April 4, 1913. Under gas-oxygen ether Dr. Lloyd operated on the left side and Dr. Furniss on the right, both kidneys being decapsulated. So far as could be determined, they appeared normal in size and appearances; the capsule was not thickened nor adherent. The wounds were closed without drainage. Within four days her headaches had disappeared and she felt better than she had for a year or more.

April 11, 1913. Phenolsulphonaphthalein, 6 mg., was given intravenously and 90 per cent. was passed in the first hour and 10 per cent. in the second. There was here evidently too much given.

April 15, 1913. Phenolsulphonaphthalein was again given intravenously, 6 mg., and 65 per cent. was passed in the first hour and 15 per cent. in the second. Two weeks after the operation he obtained the same result. Two and a half weeks after operation phenolsulphonaphthalein was injected intramuscularly and in two hours 65 per cent. was obtained. The patient went home at the end of three weeks, making the trip to Newark in an automobile. This upset and tired her very much and it was a week before she recovered.

May 18, 1913. The patient was slow in regaining her strength but complained of no more headaches. Phenolsulphonaphthalein, 6 mg., was given intravenously and 55 per cent. was passed the first hour and 10 per cent. the second.

The only time that he had obtained any albumin was immediately after the second operation, and then was a large amount with many hyaline and finely granular casts. This cleared up in three days.

DISCUSSION

Dr. Harold Capron Bailey asked Dr. Furniss what were the indications which caused him to operate and whether the benefit was theoretical or actual. He could not understand the indications in the case which called for this operation.

Dr. Furniss, in answer to Dr. Bailey's inquiry, said that that patient at one time had eclampsia and since then had never been well, having headaches, a urine with a low specific gravity, and her improvement had certainly not been great. Although there was no albumin in the urine, she had headaches which were constant and a low elimination of phenolsulphonaphthalein, and this showed that there was some derangement of kidney function. When he cut down upon the kidney it appeared to be normal. After this there was a gain of from 5 to 15 per cent. in the elimination of the phenolsulphonaphthalein which increased to the present elimination of 65 to 75 per cent. She was now completely relieved of her headaches and felt better than she had for two years. He suspected a contracted kidney and that some operation should be done.

HYDRONEPHROSIS DUE TO STRICTURE OF THE LOWER URETER CURED BY DILATATION.

DR. DAVID WILLIAM TOVEY presented this specimen, together with very clear pyelographs of the kidney, pelvis and ureter taken both before and after treatment.

SAFETY RAZOR BLADE HOLDER USED AS A SCALPEL.

DR. TOVEY presented this instrument and described its use.

SPECIMEN OF EARLY ECTOPIC GESTATION.

DR. GEO. GRAY WARD, JR., presented this specimen. The patient from whom it was removed was twenty-five years old, married five months. She had pulmonary tuberculosis and had been in the Adirondacks for the past two years. Her menstruation had always been regular, every twenty-eight days, with duration of three to four days, scanty and with slight pain. Her last regular period was on November 26. Her next period was four days late, appearing on December 28, and was more painful than usual and spotting continued. As she had some pain in the left side, a diagnosis of possible ectopic gestation was made. On January 24 Dr. Ward made a vaginal section and found free blood in the abdomen; he then made an abdominal section and found a very early unruptured tubal pregnancy. The uterus was of the infantile type and contained an interstitial fibroid the size of a small marble in the fundus. As the husband had an uncured syphilis, and in view of the tuberculous history and the presence of the fibroid, a supravaginal hysterectomy was done, leaving the right ovary *in situ*. The appendix was examined and found to be tuberculous; this was removed. A nodular mass the size of a walnut was found in the wall of the ileum about 18 inches from the cecum, evidently tuberculous; therefore, a resection of the gut was made and an anastomosis completed. The patient made a good recovery.

EPITHELIOMA OF THE CLITORIS.

DR. WARD also reported this case. The patient was forty-six years old and had been married thirty years. She was a Russian-Hebrew and admitted to Dr. Ward's service March 6, 1913. She had had six children, all normal labors, and she had had no miscarriages. There was no family history of any malignant disease or tuberculosis obtainable. The menopause was established two years ago. One year ago the patient noticed a small pimple in the region of the clitoris which steadily increased in size. Three months before entering the hospital the growth ulcerated. The patient had a marked degree of cachexia. Her blood examination showed but 30 per cent. hemoglobin, and 1,150,000 red cells; there was no leukocytosis. She complained of pain and loss of strength. There was but a slight loss in weight. The size of the growth was as large as a silver dollar, the clitoris and vestibule and a portion of the left labia being involved. She was operated upon March 7, 1913, and a complete excision of the growth made; a considerable area of normal tissue was removed down to the periosteum of the pubic bones. The edges of the wound were brought together with silkworm sutures. She made a normal recovery and was discharged April 10, 1913. She immediately began to improve in general health, and her blood picture rapidly improved.

Dr. E. A. Bullard of Brooklyn reported

A CASE OF OCCLUSION OF THE CERVIX AND PARTIAL OBLITERATION OF THE UTERINE CAVITY FOLLOWING PUERPERAL SEPSIS.*

DYSTOCIA FOLLOWING AN INTERPOSITION OPERATION, COMPLICATED BY PLACENTA PREVIA.

Dr. George W. Kosmak reported this case. The patient was a multipara about seven months pregnant, who was admitted to the Lying-In Hospital on April 19, 1913, with a history of sudden bleeding without cause which began a few hours previously. The patient was not in labor and an examination made about two hours after the hemorrhage began showed the vagina full of large blood clots. A search for the cervix disclosed the same at the extreme upper end of an elongated vagina in a position above the brim of the pelvis. It was very rigid, admitted one finger, and the canal was about two inches long. The cervix could not be pulled downward and further exploration showed the presence of a centrally situated placenta previa, which had separated from the lower uterine segment. In view of the necessity of an immediate delivery, as the patient was bleeding quite freely, an abdominal Cesarean section was decided on as offering the most favorable outcome for the patient. The fetal heart could be heard but it was faint. A gauze pack was temporarily inserted and the patient prepared for operation by dry shaving and the application of two coats of tincture of iodine (5 per cent.) to the abdomen. After anesthetizing the patient the gauze was removed and a vaginal douche of plain sterile water given on account of the previous vaginal manipulations. The Cesarean section was done by the method usually employed at the Lying-in

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* For original article see page 761.

Hospital, the abdominal incision being made from a point about 3 inches above to 1 inch below the umbilicus. The uterus was incised longitudinally at the fundus without delivering the same, and the membranes separated with the hand. A small fetus, which breathed for a short time, was extracted by the breech. The placenta was found almost separated in the lower segment of the uterus over the cervix. It was readily extracted with the membranes and the uterus sutured in the usual manner in two layers. There was comparatively little bleeding and prompt contraction occurred. The abdomen was closed in three layers and the patient returned to bed in fairly good condition. She made an excellent recovery and was discharged from the hospital in three weeks, although up on the tenth day. Her anemic condition was largely benefited by keeping her on the roof of the hospital during the greater part of the time.

A more complete history obtained subsequently showed that the patient who was thirty-five years of age, married seventeen years, had had six children and four early miscarriages. Her previous labors were easy except the fourth in which instruments were required because of the large child. She was in bed ten days and dates her uterine prolapse from this time. It was evidently complete, as she stated that the ulcerated cervix projected entirely beyond the vulvar opening. She was operated upon in the New York Hospital in August, 1912, and made a good recovery following an interposition operation. Her last regular period was dated September twenty-first to twenty-sixth, 1912, and was normal. During her pregnancy she was well except for an inability to urinate readily and catheterization was resorted to several times. The patient stated that she worked hard all through her pregnancy and did not observe anything abnormal until she began to bleed on the morning of her admission to the hospital.

An examination made on May 21, 1913, showed the patient to be in good general condition with a small abdominal scar. The uterus was in good position, with the fundus below the bladder and well involuted.

The case was reported as showing the possibility of a dystocia following this operation. It was unfortunate that the condition was complicated by the presence of a placenta previa, although with the lack of mobility of the cervix it is doubtful whether labor could have taken place at term without resort to interference and with the greater distention of the uterus at this time a rupture could readily have taken place. Sterilization of the woman was not permitted at the time of operation because her condition of shock prevented any extension of time necessarily required by the same.

REVIEW.

Contributions to the Anatomy and Development of the Salivary Glands in the Mammalia. By George S. Hutchinson and H. von W. Schulte. Illustrated with many plates. Quarto, boards, pp. v+364. Volume IV of *Studies in Cancer and Allied Subjects Conducted under the George Crocker Special Research Fund at Columbia University.* New York: Columbia University Press: 1913.

This volume continues the extensive studies which Dr. Churchill Carmalt made on the development and comparative anatomy of the salivary apparatus in mammalia.

In man the buccal sulcus divides two salivary structures, the orbital inclusion and the parotid. The orbital inclusion has not been sufficiently studied hitherto, since its amount of glandular substance is very variable. It is only exceptionally continuous with the parotid, sometimes an intermediate body, the orbital parotid, is found. A similar structure may develop between the submaxillary, the greater sublingual and the apical gland (tip of the tongue). This is called the glandula Nuhu Blandiu. It is shown by von Schulte that the parotid and the submaxillary glands develop in a similar manner; the ducts develop freely along the oral epithelium. The sublingual is in reality part of the submaxillary, and its duct develops by constriction. In the second, larger part of the volume, a number of types of mammalia are studied. It is shown that the submaxillary and sublingualis major may be equivalents of simple glands, rows of which have been condensed to form ducts. The parotid and submaxillary glands may have flanges which seem to produce a more rapid growth.

The authors state that the site of the orifice of a gland does not justify conclusions in regard to the status of the gland, and even the general character of its secretory epithelium affords no criterion for its morphological status.

E. Schwarz.
L. Strong.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Signification of Albuminuria in Pregnancy.—H. Williamson (*Lancet*, May 7, 1913) says that albuminuria in pregnancy may be due to an uncompensated cardiac valvular lesion, an acute ferbrile illness, or an infection of the bladder or renal pelvis, but in these cases the lesion is usually detected by careful clinical examination, and we are seldom in doubt as to its significance. Two other conditions, differing widely in their pathology and prognosis and demanding very different treatment, both attended by the presence of albumin in the urine, edema, headache, and not infrequently epileptiform convulsions, are often difficult to distinguish from one another. These are chronic nephritis and toxemia of pregnancy. Acidosis is found constantly in cases of pregnancy toxemia when the lesions are of a certain grade of severity, and is not found in cases of chronic nephritis even when the symptoms are severe. The onset of an acidosis in the course of a chronic nephritis in pregnancy may be interpreted to mean that toxemia has been added to the existing lesions. The writer does not believe that the symptoms are due to the acidosis; because the symptoms are often present in a mild form before we can find any evidence of acidosis, but if we diminish the acidosis we alleviate the severity of the symptoms. In cases of pregnancy toxemia chloroform should never be administered, because the action of chloroform is to render more grave the lesions which already exist and to increase the acidosis. Ether administered by the open method is in every way preferable as an anesthetic. Calomel should not be used as an aperient, for the lesions in the liver and kidney produced by mercurial poisoning are of the same nature as those of pregnancy toxemia, and it is probable that mercury even in small doses will increase the gravity of the lesions already existing. For a similar reason douches of mercurial antiseptics should never be employed. In all cases where an acidosis is present intravenous infusion with a solution of sodium bicarbonate or sodium acetate should be practised. The fat metabolism should be spared as far as possible by the administration of glucose, giving it by rectum when vomiting is present and by mouth in the form of glucose lemonade where the digestive functions are not deranged. When a pregnant woman suffering from chronic nephritis shows evidence of the existence of acidosis, the uterine contents should be evacuated without delay, for with a kidney previously damaged the prognosis of pregnancy toxemia is very grave.

Bilateral and Multiple Ectopic Pregnancy.—E. McDonald and W. A. Krieger (*Jour. A. M. A.*, 1913, lx, 1766) speak of multiple ectopic pregnancy as by no means an uncommon occurrence. They say that to make an exact diagnosis of bilateral ectopic pregnancy, there must be either a fetus or chorionic villi in each tube. In such a rare condition, the diagnosis should be exact. Chorionic villi are essential to placental formation and never exist without pregnancy, while decidual cells may be both in the tube and uterus. For these reasons, reports of fifty-two cases reported as bilateral ectopic pregnancies have been collected into two groups: one of which has a definitely proved fetus on each side or chorionic villi on each side, and the second which consists of cases that have not this proof or have not been thoroughly studied. In this second table, it is probable that most of the cases are true bilateral ectopic pregnancy, but search had not been made for chorionic villi in the walls of the tube. The writers have added to these lists two cases which are of interest. One patient had apparently three pregnancies, one in each tube and a uterine one which miscarried. She had two separate and individual ruptures with shock and collapse.

Extrauterine Pregnancy with Living Child.—N. L. Hood (*Lancet*, June 14, 1913) records this case. Six and a half months before the onset of what resembled labor pains and on two other occasions at intervals of two weeks after the first attack, the patient had violent abdominal pain and faintness. Aside from the passage of blood from the vagina when urinating during the last month of pregnancy there were no other symptoms until the pains like those of labor began. A large tumor corresponding to a full-term pregnancy could be felt. As pains continued the abdomen was opened. A child weighing seven and a half pounds was removed from a sac between the layers of the right broad ligament, the placenta lying partly on its anterior wall and partly on the uterus, and extending toward Douglas's pouch. Only a portion of the sac and placenta could be freed. The cord subsequently came away through the wound, leaving a sinus which finally closed after dissection. When the case was reported the child was three years old and apparently normal in every respect. The mother was also in perfect health, but had to wear a belt to prevent a ventral hernia.

Another such case is reported by J. S. Horsley (*Surg. Gyn. and Obst.*, 1913, xvii, 58) who says that the literature contains records of 104 other cases. Of the 104 cases there were forty-nine maternal deaths, largely before the antiseptic era. A really successful case is one in which the mother has recovered and the child is alive and well twelve months after the operation. The recorded cases include five well-authenticated instances which meet this test besides that of the writer and the one of Hood, just mentioned. In his own case there was slight bleeding in the two months following the first missed period, but no pains until labor began. There was no suspicion that the case was not normal until a vaginal examination was made at this time. The child was found floating among the intestines, covered only by a thin membrane which also surrounded the placenta. There were few adhesions of the omentum and intestines to the sac and these were freed and ligated. The placenta and sac had a distinct pedicle from the broad ligament and they were removed after its ligation.

Treatment of Eclampsia by Morphine and its Adjuvants.—Jules Rouvier (*Arch. mens. d'obst. et de gyn.*, June, 1913) says that since we have not yet succeeded in getting an efficient remedy for the disease we must at least lessen the crises as soon as possible, and assist in the prompt elimination of the causative toxins. The author has treated twenty cases, of which two were without crises. An impartial analysis of these cases shows that the result of this treatment is more rapid and efficatious the earlier in the case the morphine is administered. In gravid, parturient, or puerperal patients who have had eclamptic crises or are liable to these attacks, we should give three injections of morphine, separated by an hour's interval, followed by three others separated by two-hour intervals. In addition there should be instituted a water diet, followed later by a half-milk diet, and later still by full milk. Lavage of stomach and intestine are also to be employed. This treatment is of value in all cases which are threatened with eclampsia. If possible it should be given before the first attack as a preventive measure. As soon as an attack has occurred morphine should be begun. Small or medium doses should not be given, since time is wasted and good results are not rapidly obtained. Kidney disease is not a contraindication for morphine, as it assists the kidneys. Unconsciousness is also not a contraindication, as some authors believe.

Malignant Chorioepithelioma.—Robt. Proust and Xavier Bender (*Rev. de gyn. et de chir. abd.*, April–May, 1913) state that we may consider that chorioepithelioma is a tumor of the embryonic type, but an embryoma developed at the expense of the embryonic adnexa; it is a malignant neoplasm in which the fetal elements invade the organism of the mother and act like a destructive parasite. It has been long believed that such a tumor can develop only with the coexistence of a pregnancy. It is now known that it may develop in the uterus, or tube, and even outside of the generative organs at the expense of placental débris which have acted as emboli. In both these cases there must be an intra- or extrauterine pregnancy. But aside from pregnancy, and in uterus, ovary, or tube tumors have developed reproducing exactly the form of the chorioepithelioma, tumors that are malignant and invading, and whose analogy to the uterine placental tumors are striking. These tumors have no relation with gestation at all; they develop without fecundation, at the expense of embryonic germs included in the genital glands and represent a form of degeneration of teratomata whose genesis is explicable only by the theory of merotomy. Studying first the chorioepitheliomata in relation with gestation we find that the chorionic villi have the power of penetrating the vessels of the placenta and uterine sinuses. The placental elements are carried to a distance, and fragments of syncytium are carried along in the current of the circulation as emboli. These have been found in the lungs of women who have died of eclampsia. As to pathology this tumor is ectodermic, epithelial, of fetal origin, in the genesis of which two elements participate, the syncytium and the cells of Langhans. The size of the uterus is increased to that of the uterus at the third or fourth month; it is soft and elastic, and irregular in shape. The appearance of the tumor is very variable. It is often necrosed or ulcerated, always badly limited, with prolongations into the uterine muscle. The tumor may develop directly under the uterine mucosa or in the uterine muscle. We might say that it has four forms: circumscribed, vegetating, ulcerated and interstitial. Secondary tumors form in the uterus, and neighboring organs, the bladder and intestine. The tumor is characterized by two sorts of elements, plasmodial masses and clear polyhedral cells. Between the cells of Langhans and the multinucleated masses all intermediate forms are found. The tumor may appear after a pregnancy, without alteration of the placenta, or it may be ingrafted on a placental polypus, or follow a hydatidiform mole. Metastases have been found in almost all of the organs, the most frequent being pulmonary. Next most frequent are those in the vagina and vulva, tubes and ovaries, liver, kidneys and brain. The tube is very rarely affected. Here the tumor is very friable and hemorrhagic and metastases are frequent. It has never been diagnosed and is only found at autopsy or operation. Aside from pregnancy the tumor is developed most frequently in the vagina; it is identical with metastatic nodules in the same location. The most likely theory of origin is that of Pick, who believes these tumors are derived from normal chorionic villi, embolized or secondarily degenerated at their point of fixation. Chorioepitheliomata derived from teratomata are independent of pregnancy, and occur in young girls, in women of advanced age, and even in men. They are found especially in the genital glands, the ovaries and testicles. They present the characteristics of the ordinary chorioepithelioma developed at the expense of rudimentary ectodermal cells. The author believes that it is not sufficient to find in a tumor polynuclear giant cells, and isolated plasmodial masses to call it chorioepithelioma, still it is impossible to deny their likeness to the true tumors of that type.

Treatment of Puerperal Infection.—R. T. Gillmore (*Jour. A. M. A.* 1913, lx, 1944) states that puerperal infection is not usually a local disease but is a general infection or bacteriemia. The primary focus is located in the parturient canal, endometrium, tubes, cervix, vagina or perineum, and is secondary in importance to the general infection. In the severe bacteriemic, or general infections, the streptococcus is usually responsible. The pneumococcus, a variety of streptococcus, is sometimes found. When there is a pyemia some variety of the staphylococcus or the colon bacillus is usually the cause. This organism does not multiply in the blood stream as does the streptococcus, and is usually localized. In order to inaugurate a rational treatment in puerperal infection, it is imperative to ascertain by a blood culture the germ causing the infection. From this specimen an autogenous bacterin is made. Clinical experience demonstrates that the administration of vaccines is unsatisfactory unless there is a leukocytosis above 15,000. When the count is below this number, the administration either hypodermically or by mouth of nuclein is indicated. For the nonoperative treatment of an uncomplicatedcase of puerperal infection the patient should have complete rest, physical and mental, in a well-ventilated, sunny room. Drainage should be favored by the Fowler position. The hyperpyrexia should be controlled by cold sponging and an ice-bag on the head. In the case of a local pelvic inflammation, an ice-bag should be applied over the affected area. Elimination is an important factor and should be favored by both the bowels and the kidneys. The drop method of introducing normal saline solution into the rectum is desirable, as it saves the stomach, allays thirst and favors elimination by the kidneys. As it requires five days to make an autogenous vaccine, first a serum or antitoxin should be administered, followed by a reliable stock vaccine if the blood count is favorable and there is an indication that the patient lacks sufficient reaction to combat the infection. The stomach should be carefully guarded. All useless medication, whisky, quinin, etc., should be avoided, and the stomach practically reserved for nourishment only. Feed the patient carefully, at regular intervals. Discontinue breast nursing unless the mental effect is too depressing in the mother's weakened condition. Operative treatment is positively limited to absolute indication. Uterine curettage is to be recommended only for a hemorrhage, which indicates that there is a foreign body in the uterus. The uterus should be left alone in the event of the retention of the membranes. Should a pelvic abscess develop, the indications are for an extraperitoneal drainage, preferably by the vaginal route, and under gas or scopolamin and morphine as an anesthetic. Palliative measures should always be tried before a radical operation is considered. In the lying-in period, pyosalpinx demands the same procedure as would be indicated otherwise. A radical operation must not be attempted until pyosalpinx becomes chronic. This is determined by a normal temperature and a low leukocyte count. The operative procedure in acute pyosalpinx should not exceed vaginal drainage except in rare instances. In those unfortunate cases of uterine multiple abscess there is authority for considering the necessity of removing the uterus, but von Veit believes that in those cases in which the puerperal sepsis has become alarmingly general and the blood is swarming with streptococci, the removal of the uterus is decidedly a doubtful procedure. When there are few streptococci in the blood, the patient will recover without a hysterectomy. When the streptococci are confind to the lochia, the operation is contraindicated. The writer emphasizes the necessity of resisting the temptation to give vaginal and uterine douches. The discharge, if any, should not be washed away with an antiseptic, as this inhibits the antiseptic action of the normal secretions and prevents the phagocytic action of the white blood cells on the bacteria.

Relation of Adhesions of the Placenta to the Development of the Fetus.—A. Agazzi (*Ann. di ostet. e gin.*, June, 1913) gives facts to substantiate the possibility of the normal development and delivery of the fetus in cases of adhesions of the placenta to the uterus, describing an illustrative case. In a case of Neumann's, macroscopic examination showed nothing abnormal in the placenta, but microscopically it was seen that there was an absolute absence of decidua, so that the chorionic villi left from the syncytium interlaced directly with the muscular fibers of the uterus, making in them growths of interstitial connective tissue. Alaxandroff, in a case of rupture of the uterus, found an absolute absence of decidua and of the glandular stratum of the placenta, the presence of syncytium in some parts, and the villi continuous with the muscular fibers. In the author's case, after great efforts the placenta was brought away in pieces, a portion remaining behind. Microscopically some of the pieces were perfectly normal. The villi were normally arranged, but some of them appeared as if hyperfunctionating. The blood-vessels were abnormally developed and turgid with blood. In other zones there were evidences of degeneration of an advanced grade. The decidual connective-tissue cells were without nuclei, pale, and some of them without any protoplasmic contents. The villi showed alterations in all stages of necrosis, some atrophied, some without any syncytium. There was intimate fusion of the villi with the altered and adherent decidua, preventing the removal of the placenta from the uterus. In this case there had been a puerperal infection at the previous pregnancy, which was the etiological factor of the lesions of the placenta. She had also suffered from severe malaria. The child was perfectly developed and born naturally. The hyperfunction of a part of the placenta counterbalanced the lack of nutrition from the diseased parts and permitted of a normal development of the child.

Sero-diagnosis of Pregnancy by the Dialyzation Method.—In this paper C. F. Jellinghaus and J. R. Losee (*Bull. Lying-In Hosp., N. Y.*, 1913, ix, 68) discuss the principle upon which Abderhalden's biological test for pregnancy is based and give a description of his two methods, with a detailed account of the technic of the dialyzation method as improved by him up to February, 1913. They urge the importance of carrying out Abderhalden's technic in detail, and describe the numerous errors they have made and show how to avoid them. While their experiences have not absolutely proven Abderhalden's assertion, they favor the opinion that it is possible by the dialyzation method to distinguish between the healthy pregnant and the healthy nonpregnant woman. Whereas this is spoken of as a test for pregnancy or nonpregnancy, it is rather a test for the presence or absence of chorionic epithelium still capable of being washed into the general circulation. It is therefore not always useful as an aid in diagnosing an ectopic pregnancy, for if the ectopic had been followed by a tubal abortion and hematocele, the test would not necessarily give a positive reaction even though Abderhalden's claims are a fact. If the reaction were positive it would not aid us in differentiating between an early intrauterine pregnancy with diseased adnexa and an extrauterine. If Abderhalden's claim is a fact the test may be useful in the following: Diagnosing early pregnancy, especially in single women in whom an examination is refused; differentiating between uterine myomata and pregnancy; diagnosing chorioepithelioma; diagnosing or excluding pregnancy in nursing women with amenorrhea; differentiating between pregnancy and other causes of amenorrhea (change of climate, tuberculosis, diabetes); differentiating between pregnancy and menopause in women with an enlarged uterus due to metritis. It opens a field for diagnosis in other diseases in which ferments are formed. It offers a possible method for obtaining further information about the toxemias of pregnancy.

Acute Membranous Vaginitis in Pregnancy, due to Enterococcus.—G. E. Shoemaker (*Penn. Med. Journ.*, June, 1913) records two cases in which, shortly before the end of pregnancy and without constitutional symptoms, there was great soreness, swelling and intense itching of the vulva and vagina associated with a copious discharge, consisting partly of whitish fluid and partly of masses of yellow cheesey semisolid material. In one case within the vagina was the yellow semisolid material, occurring not in flakes like a membrane, but in masses the size of a spoon bowl. It was not adherent. The bright red appearance extended throughout the vagina and about the cervix, where quantities of the thick material were removed mechanically, but without leaving abraded or bleeding surfaces. No patches of ulceration or invasion of the deeper layers of the mucous membrane were detected. Bacteriological examination showed the presence of the enterococcus. In the second case, in which oidium albicans was present as well as the enterococcus, the mucous membrane was more inflamed. There was a cockscomb-like swelling in the vestibule caused by inflamed papillæ, the surfaces feeling quite hard from engorgement. The whole vagina was dusky red and covered with yellow masses. On an old area of granulating laceration of the cervix the pseudomembrane was not as easily wiped away as it was elsewhere, and here a slightly bleeding surface was left. The slightest traumatism would break the surface of the mucous membrane anywhere in the vagina. Permanganate of potassium 1 to 500, used as a douche, and daily applications of argyrol solution resulted in recovery.

Cervical Decidua.—It has long been recognized that the cervix may show decidual change, although the majority of texts deny the possibility and voice the opinion of Gebhart that the internal os represents the lower limit of decidual formation. F. W. Lynch (*Surg. Gyn. and Obst.*, 1913, xvi, 694) records a case of multiple soft polypi in the cervix which caused repeated bleeding during pregnancy. Between the polypi was found tissue presenting decidual change. The surface epithelium was lower than in the other areas, and in certain sections presented the typical flattened surface epithelium of uterine decidua. The cell margins were distinct and the nuclei round. There were comparatively few granules noted in the protoplasm. The stroma was very edematous. In favorable sections the large decidual cells were seen grouped about the blood-vessels as if beginning in the perithelial coat.

Pituitary Extract in Obstetrics and Gynecology.—G. L. Basse (*Ann. di ost et. e gin.*, June 30, 1913) endeavors to show the advantage of extracts of pituitary body in obstetrics and gynecology, its indications, contraindications, and best dosage. Extract of the hypophysis has been used to increase uterine contractions, to cause labor, in the treatment of osteomalacia, in gynecology as a hemostatic, and exciter of the muscle of the bladder and intestine, in cases of dysuria and paresis of the intestine after operation, and to increase arterial pressure in peritonitis. In the Clinic at Florence it was demonstrated by Cighiri that in pregnancy there is an increase of secretory function in the cells of the hypophysis, by the increased number of cells in function, and the greater abundance of granules in their protoplasm. He concludes that in pregnancy there is an increase of secretion of the hypophysis through the presence of abnormal toxic substances, and the granular secretion is markedly modified in character. These granules are in relation with the secretory function of the gland. Anatomical observations and experiments an animals have shown that the extracts of the hypophysis have an exciting action on the pelvic organs. In the Clinic at Florence have been treated 150 cases, 135 of them for secondary uterine inertia. One case of osteomalacia was treated with improvement. In gynecology it was used as a stimulant to the vesical muscle, a hemostatic, and to relieve hypertension in the vessels. In peritonitis it does not act as a curative measure, but symptomatically, increasing arterial tension for some hours at a time, and combating the intestinal paresis, while increasing kidney action. It is to be preferred to adrenalin because that affects the heart, increasing its work, has no action on the intestine, and decreases urine. The extract should generally be used intravenously; in peritonitis intramuscularly after operation. It was used in two cases of peritonitis, and in three cases of meteorism and intestinal paresis, with good result. Extract of hypophysis acts as an antiovarian, lessening the action of the ovarian hormones, exciting the unstriped muscular fibers, and increasing uterine contractions. All hemorrhages from the endometrium, especially metrorrhagia of virgins, are influenced by pituitary extract, which is especially useful in menstruation, relieving herpes, pruritus, and psychic disturbances. This drug has no bad effects on the patient. The first contractions of the uterus are strong, tetanic, but they soon become rhythmical, with suitable pauses. The action varies in different cases, in primiparæ, pluriparæ, and virgins. It has no cumulative action. Dose is from 0.50 to 4 c.c. The pulse is not modified, and arterial tension is somewhat increased. In maternal dystocia due to incomplete dilatation, or premature rupture of membranes, dilatation does not become complete, but is sufficient to allow of terminating the labor artificially. If dystocia is due to bony contraction of the pelvis, if the contraction is not too great, labor is assisted. If pushed too energetically it may cause asphyxia of the fetus. In hemorrhage due to placenta previa or premature detachment of the placenta it gives the best results. In abortion it has little effect on hemorrhage. It has no abortifacient action.

GYNECOLOGY AND ABDOMINAL SURGERY.

Tubal Reimplantation.—The following operation has been devised by J. de Tarnowsky (*Jour. A. M. A.*, 1913, lx., 1221) for positive sterilization of the female with the possibility of restoration of fecundity if desirable, in such conditions as tuberculosis, nephritis, syphilis and certain mental disorders. Amputate the tubes on either side 1/4 inch from the uterine cornua. Invaginate the distal half of each stump and close the lumen with two catgut sutures. On the posterior uterine wall, make two parallel vertical incisions 1 inch long and 1/2 inch apart, not over 1/4 or 1/5 inch deep. With a curved forceps, burrow between these incisions, creating a canal of sufficient size to contain the two tubes. With the same curved forceps remaining in the new canal, grasp the opposite tube and draw it through the canal so that it emerges on the opposite side. Reintroduce the forceps from the opposite side and repeat this procedure with the remaining tube. In the new canal the tubes should be parallel to each other, one lying above the other, the cut extremity of each tube emerging on the opposite side of the new canal. Make a small cuff by everting the tubal mucosa (it is sometimes necessary to make two small incisions before being able to evert satisfactorily) and secure cuffs to the margins of the new canal by fine catgut stitches which also control any uterine oozing which may be present. Test the patency of both tubes by means of a fine probe.

Tuberculosis of the Tubes.—F. Jayle (*Presse méd.*, June 21, 1913) says that of the genital organs the tube is most liable to tuberculous lesions. Their diagnosis is not always easy, and the tubercle bacillus may be accompanied by a mixed infection by other sorts of germs. Only a histological examination will give a certainty of the nature of the infection. The author divides tuberculous salpingitis into two great classes—pure tuberculosis, and that associated with other infections. Pure tuberculosis occurs in four forms—the granular, miliary, or peritoneal, causing ascites; pyogenic; lardaceous; and polymorphous, at once granular, pyogenic, and lardaceous. In the granular form, which is most common, there are miliary granulations on the surface of the tube, which extends to all the organs covered by the peritoneum. There is ascites depending in amount on the extent of the tuberculosis. The tube is thickened, tortuous, and bound by adhesions to the neighboring organs. The infundibular extremity is obliterated. The pyogenic form is similar in appearance to simple salpingitis. It is often confined to the pelvis, while in the miliary form it extends to the abdominal organs. Suppuration may be confined within the tube, forming a closed abscess; or it may be exogenous, causing a pelvic abscess. In lardaceous tuberculosis there is hypertrophy of the tube, broad ligament, and peritoneum, without pus or granulations. In the polymorphous form all of the previously described lesions are combined. When complicated with infection from the colon the bacillus coli is present. Other organisms in cases of mixed infection are streptococci, staphylococci, and gonococci. Any ordinary form of salpingitis may exist and become complicated by the addition of tuberculosis, and this be demonstrated at operation only. Aside from the histological examination of the removed organs diagnosis may be aided by several facts. In mixed forms the previous personal history of the patient is of value. If the patient be under twenty years of age the infection is probably tuberculous. Treatment should be surgical only.

Inversion of the Uterus.—Reporting a case which occurred during the peurperium and caused by a uterine fibroid, W. C. Jones (*Surg. Gyn. and Obst.*, 1913, xvi, 632) says that in obstetrical inversion, the primary cause is uterine relaxation. The chief secondary factors are pressure on the fundus and traction on the cord. In inversion not obstetrical in origin, uterine fibroid is almost the exclusive cause. Most cases are both acute and complete; in the complete ones, the most important point is the degree of contraction of the cervix. In inversion of gynecological origin the causative tumor is of preeminent importance. In acute cases, the cardinal symptoms are hemorrhage, shock and pain. Later, the manifestations of a complicating infection may appear. In chronic inversion, the symptoms are those of marked uterine prolapse plus those of menorrhagia and metrorrhagia. In obstetrical inversions, vaginally, a large, soft, pear-shaped, bleeding tumor is found, with the placenta attached in about half the cases. Abdominally, no corpus is found, and in its place there is a cup-like depression. In gynecological cases, the diagnosis of inversion due to a fibroid frequently is very difficult. The chief points are, first, the shortening of the uterine canal produced by inversion as compared with the lengthening caused by a fibroid; and secondly, the indentation produced by the inversion on the peritoneal surface. The mortality in acute cases in recent years has been about 35 per cent. in chronic ones, about 6 per cent. In all acute and in most chronic cases, manual reposition should be tried. In most of the former, if undertaken early, and in many of the latter, this procedure is successful. If it fails, repositors, etc., may be used, but only for a short time. If these are unsuccessful, one should resort at once to some operative method, the one of choice being colpohysterotomy. This operation stands peeminent in the treatment of difficult cases of uterine inversion, on account of the facility of its performance and its success in accomplishing the reduction of the inversion, and also because of the practically complete absence of any mortality. The uterine incision should be made at first through the cervix only, and later be extended as far into the corpus as necessary to accomplish reposition. In inversion due to tumor, the treatment is mostly that of the causative fibroid. After this is removed, if the uterus still remains, in about one-third of the cases spontaneous replacement occurs, while in the other instances reduction is accomplished usually without difficulty by nonoperative methods.

Ovarian Secretion.—Reviewing this subject, A. L. McHroy (*Jour. Obst. and Gyn. Brit. Emp.*, 1913, xxiii, 265) says that the ovary has a dual function—the production of ova, and the elaboration of an internal secretion or secretions. It is of the nature of a ductless gland, carrying out its function independently of its vascular or nervous supply. The ovary controls the nutrition of the genital organs and mammæ. Removal of both ovaries before sexual maturity causes an arrest in the development of the genital organs and mammæ, and prevents the onset of menstruation or procœstrum. The infantile type is maintained and the secondary sexual characters are not well marked. Retardation of the ossification of the long bones has been observed. There is no effect upon the growth and general nutrition. Removal of both ovaries after sexual maturity causes atrophy of the genital organs and mammæ, cessation of menstruation or procœstrum, and increased deposit of fat. Removal is frequently followed by certain nervous phenomena characteristic of the menopause. Removal of both ovaries during early pregnancy causes abortion to take place. Removal of one ovary causes compensatory hypertrophy in the remaining organ independent of pregnancy or œstrus. Abortion does not take place as a consequence of removal of one ovary. The corpus luteum is concerned with the embedding and nutrition of the ovum and with metabolism. It controls the blood supply of the uterus. The interstitial cells are increased in size during pregnancy and œstrus and are concerned with the nutrition of the genital organs and the internal secretion of the ovary. Transplantation of ovarian tissue after castration prevents the occurrence of atrophy in the genital organs and the cessation of menstruation. Menstruation depends entirely upon the presence of ovarian tissue. It is a preparation on the part of the uterine and tubal mucosa for the reception of a fertilized ovum and corresponds to the period of proœstrum in animals. The menstrual discharge is the evidence of metabolic processes by means of which some unknown chemical substances are eliminated from the organism. Menstruation begins at puberty, and ceases at the menopause when the ovaries become atrophied. It ceases after removal of both ovaries, but can be made to recur by transplanting ovarian tissue into another situation. The correlationship between menstruation and ovulation is unknown. The nutrition of the uterus is dependent upon the presence of ovarian tissue. Removal of uterine secretion has no effect upon the ovaries. Ovarian extracts have been found of use in the treatment of chlorosis, amenorrhea, obesity and menopausal symptoms. Much depends upon the condition of the ovaries from which the extracts are prepared and the mode of preparation. Most clinicians agree that the extract of the corpus luteum has the most therapeutic value. Information as to the influence of ovarian secretion upon metabolism is as yet unreliable. Ovarian secretion is said to prevent the onset of obesity, and to increase the respiratory interchanges. Most observers agree as to no change occurring after castration in the nitrogen metabolism. Several authors maintain that the ovaries have a marked influence upon the excretion of calcium. Retardation of the coagulation period of blood has been found in diminished ovarian function.

Autoplastic Ovarian Graft and its Clinical Value.—B. Whitehouse (*Clin. Jour.*, May 21, 1913) records a case in which he tried the effect of an autoplastic ovarian graft after total hysterectomy. Ten months after the operation menstruation had gradually become reestablished, the last three periods had occurred at monthly intervals. During the catamenia rather severe headache had been present, but this had not been noted at other times. No dysmenorrhea had occurred, and there had been no tenderness in the abdominal scar during the periods. No dyspareunia was present and the sexual functions were exercised in a perfectly normal manner. The patient had not suffered from any "flushing," palpitation, or nervous phenomena, that are usually associated with the artificial menopause. The points which the author regards as essential to the success of a grafting operation, are: (1) Absolute asepticity and the avoidance of strong antiseptics which would destroy the vitality of the tissues. The apparent contradiction to this maxim in the cases of chronic pyosalpinx and salpingo-oophoritis is met by the fact that the pus in such cases is usually sterile and the tissues may be treated as surgically "clean." (2) The employment of minute or "seedling" grafts. (3) The presence of a good vascular supply in the tissue used as the bed for the graft. Muscle is entirely satisfactory for the purpose. (4) The ovarian tissue should be left in contact with the body fluids within the peritoneal cavity until it is required for the purpose of the grafts. In the case recorded in this paper, the ovary was placed in Douglas's pouch until the time arrived for closure of the abdominal wound.

Menstrual Molimina.—Catherine Chisholm (*Jour. Obst. and Gyn. Brit. Emp.*, 1913, xxiii, 288) says that the belief in the constant association of menstruation with pain and discomfort may often be responsible for the neglect of minor ailments and sometimes for the neglect of the early symptoms of major ones. The writer of this paper, while investigating the health of a large number of girls of the middle classes, was struck by the number of girls who, having commenced to menstruate, disclaimed any disturbance at the menstrual period. Her study of these girls shows that the majority of girls commence menstruation painlessly. A number have discomfort, some occasionally, some regularly for a time varying from one hour to two days just before and with the commencement of the menstrual period. This discomfort is often slight in character. A few have more severe pain, either regularly or occasionally. A very small number, *i.e.*, 1.8 per cent., are incapacitated. A small number, *i.e.*, 1.2 per cent., have discomfort or pain for a longer period than one or two days during the whole time of menstruation. The discomfort in girls is most frequently local in character, and when there is serious general disturbance it is accompanied by severe local pain, and probably proceeds from some local abnormality congenital or acquired. The best developed girls appear less likely to have menstrual disturbance. This freedom from discomfort is not affected by hard mental work carried on under healthy conditions.

With the above-mentioned statistics, regarding menstruation in girls, the same writer (*Jour. Obst. and Gyn. Brit. Emp.*, 1913, xxiii, 389) compares the statements obtained from 100 women who were earning their living by industrial, professional or domestic work, or preparing for it at the university. Their ages varied to past forty. One or two were sufficiently young to overlap the ages of the adolescent series. She also considers the records of two other investigators—Marie Tobler who has recorded 1020 cases and Jane M. Ketsham who has recorded two hundred cases of school girls, college girls, factory girls, clerks, stenographers. She finds that among adults the cases of disturbance at the menstrual period are many more than among adolescents. Passive hyperemia of the pelvic organs appears to be the cause of much local pain. This is relieved in the majority of cases in the first day after onset of menstruation.

Unhealthy hygienic conditions and mode of life contribute to lowering the general nervous system so that pain is readily felt and a habit of pain at the mestrual period formed. Nervous symptoms, reflex and vasomotor, are often associated with secondary menstrual discomfort. Except in a very small minority of cases this menstrual discomfort does not affect the woman's capacity for carrying on her ordinary work. Any appearance or development of mestrual pain shows a pathological condition whose cause, whether local or general, ought to be investigated and treated before the discomfort becomes established as a regular habit.

Pathology and Treatment of Uterine Hemorrhage.—B. Whitehouse (*Practitioner*, 1913, xc, 952) believes that no treatment of uterine hemorrhage can be rational, unless the cause is established; the empirical administration of hemostatic drugs is frequently useless, and indiscriminate curetting is dangerous. The menorrhagia that occurs in young girls at the age of puberty is probably due to the association of functionally mature ovaries with a deficient uterine musculature. It tends to spontaneous cure, and should be treated by rest and, if possible, removal to a higher altitude. Hemorrhage in young women may be due to mucous polypus, adenomatosis uteri, or bacterial infections of the uterus. A practical method of investigating the bacteriology of the uterus is by the collection of the menstrual blood. Hemorrhages at the menopause are frequently the result of increased arterial tension, portal obstruction, or degeneration and fibrosis of the uterus secondary to arteriosclerosis. It is probable that some cases of fibrosis uteri are syphilitic in origin. Treatment must be to reduce vascular tension. Ergot usually fails, and it may be necessary to remove the uterus. Faults in the calcium metabolism may be the cause of obscure uterine bleeding, which may be cured by discovery of the cause and the administration of calcium salts. Occasionally, the combination of thyroid tissue with calcium is beneficial. In every case of uterine hemorrhage, it is essential to look for a general cause before the local pelvic condition is investigated.

Pathology of Uterine Casts passed during Menstruation.—W. B. Bell (*Surg. Gyn. and Obst.*, 1913, xvi, 651) hopes to prove that the idea that menstrual endometrial casts are all the products of conception is entirely erroneous, although of course abortions do occur and may sometimes be confused with menstrual casts by those who are unaware of the histological differences. One or more true blood casts of the uterus may be passed during a menstrual period. These are merely retained clots which have been moulded into the shape of the uterine cavity. Endometrial casts may be thick or thin, and they are usually passed in two separate portions. Thick casts are not common, and they are the most difficult to distinguish from abortions, but the histological appearances of these casts do not resemble those of the ordinary true decidual cast of pregnancy so much as is usually thought. The specimens shown by the writer were passed by a woman whose tubes he had previously removed. She expels them almost every month. The differences in the thickness of the endometrial casts seem to depend solely on the depth of the endometrial denudation. The menstrual decidua-like reaction which can be seen in the sections, prevents the blood from breaking through easily; consequently the menstrual hemorrhage strips up the superficial portion of the endometrium instead of passing through it. This may lead to a considerable portion of the endometrium being stripped off (thick membrane) or to denudation of the superficial layers only (thin membrane). Either type of membrane may become rolled up and form a so-called 'solid' endometrial cast when retained long enough in the uterine cavity.

Esthiomène, or Lupus Vulvæ.—In a study of this subject, with analysis of six cases, Lena Kurz (*Jour Obst. and Gyn. Brit. Emp.*, 1913, xxiii, 353) claims that the term esthiomène has been misunderstood and misapplied by many authors. She holds that it should be retained as a useful term replacing the expression "hypertrophy with ulceration." It should be clearly understood that it is a tertiary syphilitic lesion. "Lupus vulvæ" should be replaced by the expression "tuberculosis of the vulva." Lupus vulgaris as it occurs in the skin, often of the face, has not been known to occur in the perineum. Tuberculous ulceration and tuberculous hypertrophy, however, do occur in that region. The term elephantiasis has been applied to hypertrophy occurring in chronically edematous parts whence the return of lymph has become obstructed or rendered sluggish, and where owing to the unhealthy state of the enlarged parts a low form of chronic inflammation has set up. The hypertrophied masses of esthiomène are not edematous tissue enlargements; they are granulomatous growths with a tendency to necrosis. Esthiomène is not a disease *sui generis*. It is not a form of low chronic ulceration occurring on a soil weakened by constitutional syphilis or tuberculosis. Esthiomène is not a merely local inflammatory state following on irritation. There is no relationship between tuberculosis and esthiomène.

The only connection existent between esthiomène and malignant disease is that the former may occasionally undergo malignant degeneration. Esthiomène is not due to lymph stasis hence it does not belong to the group of hypertrophies called "elephantiasic." The reasons for regarding esthiomène as a tertiary syphilitic manifestation are: (*a*) A direct or probable history of syphilis is almost always obtained. (*b*) The majority of early cases of esthiomène respond to antisyphilitic treatment. The late and chronic cases which do not respond do not indicate that esthiomène may at times be due to other causes than syphilis; there are many tertiary lesions, such as strictures and leukoplakia and others which do not yield to the usual antisyphilitic remedies and which are none the less due to syphilis. (*c*) The chronic course of esthiomène marked by attempts at healing with subsequent relapses, the absence of local disturbances, the non-impairment of the general state of health indicate the syphilitic nature of the condition. (*d*) The masses of cicatrical tissue with subsequent contraction producing severe strictures and extensive deformities is typical of no other disease. Where the necrosing process is in excess over the tendency to fibrosis we have the enormous tissue destruction characteristic of syphilis. (*e*) In no other constitutional disease is there such a constantly present combination of hypertrophy and ulceration as in syphilis. In elephantiasic hypertrophies there may be a small amount of ulceration. Often none is present. In tuberculosis of the vulva the ulceration is usually extensive and the hypertrophy of parts is slightly marked or absent. (*f*) The miscroscope reveals the typical gumma or granuloma of the third stage. (*g*) Up to the present time we find no cases recorded where the spirocheta pallida was found in esthiomènic tissues. It is a well-known fact that the organism does exist though in comparatively small numbers in the lesions of the tertiary stage, but they are usually difficult to find. With easier methods of demonstrating the organism the time will no doubt come when the spirocheta of Schaudinn will be seen in esthiomènic tissues with the same ease as the bacillus of Koch in tuberculosis lesions. (*h*) With equal certainty of proof will the positive Wassermann reaction relegate all cases of esthiomène into the field of tertiary syphilitic lesions.

Pelvic Hematocele from Rupture of a Blood Cyst of Ovary.—J. A. C. Kynoch (*Jour. Obst. and Gyn. Brit. Emp.*, 1913, xxiii, 304) states that it has been the tendency to consider all hemorrhagic effusions into the female pelvis as a consequence of some form of ectopic gestation. Recent researches, however, by reliable observers have clearly shown that in rare cases the cause of pelvic hematocele may be quite distinct from the presence of pregnancy. There can be no doubt that occasionally severe intraperitoneal hemorrhage may occur from a ruptured Graafian follicle, corpus luteum or hemorrhagic ovarian cyst, without there being any evidence of pregnancy. The writer records a case which appears to be one of hemorrhage into an ovarian cyst, from which there had been an escape of blood at intervals, and which was the source of the intraperitoneal hemorrhage.

DEPARTMENT OF PEDIATRICS.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Desiccated Milk in the Feeding of Normal and Sick Infants.—Bonnamour (*Arch. de. méd. des enf.*, May, 1913) states that with desiccated milk normal infants can be successfully nourished from birth, and sick children will return to complete health when thus fed. The author gives histories of twenty cases treated with success by him. Improvement begins at once. It is of especial value in sick infants when the cream has been removed, if the child is suffering from gastrointestinal trouble, absence of cream rendering the milk more digestible. Each bottle of milk should be freshly prepared before use. Milk powder is to be dissolved with freshly boiled water added slowly, and a little sugar may be added if desired. Up to six months of age half the cream should be removed; from then on cream is gradually increased. Seven bottles are to be given at first in the twenty-four hours. The advantages are that the food is sterile, is mixed with sterile water, is cheap, requires no elaborate preparation, and is easy to transportation.

Nursing of Infants among Working Mothers.—Felhöen (*Ann. de méd. et chir. inf.*, June, 1913) read, at the Congress for the Ptotection of Infancy, held at Bordeaux, a paper recommending that every owner of a factory or workshop employing at least 100 women from the age of eighteen years up, should provide an industrial crèche, where mothers could place their infants during the day, and where they could go for a half hour three times daily to nurse their babies. If we wish the infant of a working mother to survive we must have her placed so that she can suckle her infant without loss of pay. Children separated from their mothers die at the rate or fifty out of every hundred. When placed with neighbors for day care the mortality is increased to 86 per cent. When kept at a regular crèche it is still very high. If placed in an industrial crèche attached to the factory they can have the benefit of the mothers' milk, and the mothers' health will be better. In cases in which this plan has been tried the factory owners have expressed themselves as pleased with the results. A physician selected by the owner of the factory should be in attendance at the crèche twice a week. The

Congress adopted the resolution with reference to the requirement by law of such industrial crèches.

Leukocytic Resistance and Albuminuria in Infants.—Emile Roux (*Ann. de méd. et chir. inf.*, June 1, 1913) says that every albuminuric must be considered as an intoxicated subject in whom the kidney plays the most important part in the disease. The author believes that in this toxemia badly eliminated toxins and pathological body fluids are both of importance. Most of the convulsions can be attributed to a blood dyscrasia combined with toxemia. Clinically, physically and physiologically the serum of albuminurics is similar to that of normal persons. The hemolyzing action is also normal. Red and white corpuscles are normal in number. Only the resistance of the white blood corpuscles is changed and on this depends the blood dyscrasia. Renal fibrosis is rare in infants; the kidney is still competent to fulfil the rôle of emunctory and the morbid phenomena result in a toxemia by hyporesistance. Diet will lessen the proportion of the alimentary toxins; hygiene and functional excitation of the skin and other emunctories would aid the body resistance; but we must also increase the pararenal defense. Tonic treatment, feeding, fresh air, and mineral cures are valuable. But the dynamics of the leukocytes must be increased by opotherapy, making use of thyroid extract.

Scoliosis and Chronic Appendicitis.—M. Delapchier (*Ann. de méd. et de chir. inf.*, June 1, 1913) says that chronic appendicitis is a frequent cause of scoliosis. The patient has between the acute attacks a point of constant tenderness over the appendix. To protect this point he contracts the abdominal and spinal muscles, producing spinal curvature, a large curve to the left in the lumbodorsal region and a small curvature to the right which is compensatory. This is especially the case in conditions where the exacerbation is brought about by exercise. The author has found this condition of scoliosis in 37 per cent. of his operative cases of appendicitis. Every surgeon should before operation examine the condition of the spine for evidences of scoliosis, and every kinesotherapeutist should before giving treatment look out for the presence of an appendicitis. Operation for appendicitis when complicating a scoliosis is indicated, since we cannot expect to get a cure of the scoliosis without operation on the appendicitis, and we may do harm to the inflammatory condition of the appendix by making use of too violent exercises and movements. It is desirable to proceed most carefully in kinesitherapy in a patient who has had an incision for operation on the abdomen.

Remote Results of Salvarsan in Syphilis of Infants.—Johann v. Bokay (*Arch. f. Klinderheil*, Bd. lx–lxi, 1913) has treated in 1911 twenty-six cases of syphilis in infants, of which two have remained under observation to the present time, that is two and one-half years from date of injection. Of these ten, six congenital cases have relapsed, and four have remained cured, with absent Wassermann reaction. Relapses occurred in from three and one-half to eleven months. All the relapses were very light and recovered under calomel treatment. Of the four permanently cured children, two suffered from congenital and two from acquired syphilis. The histories of these ten cases are given. The author's first impression of this treatment was that the action was somewhat more prompt than that of mercury. From these four cases he believes that the "sterilans magna" of Ehrlich may be obtained in at least some congenital cases with a permanently absent Wassermann reaction.

Late Hereditary Syphilis.—Geo. Alsberg (*Arch. f. Kinderheil.*, Bd. lx–lxi, 1913) says that late hereditary syphilis is a rare affection in childhood. It shows itself in gummatous conditions, or in tabes and paresis, so that it is difficult to differentiate between hereditary and acquired syphilis, and from ordinary tertiary syphilis. The author reports a case of severe tertiary syphilis with exophthalmos cranial caries and involvement of liver, spleen, glands, and lungs. The child was born with snuffles, and cracked lips. The more severe the syphilitic manifestations are at birth the more likely are there to be permanent stigmata and relapses, and affections of the bones. The bones of the extremities are most likely to suffer, those of the skull less so. Out of 208 cases of congenital syphilis two-thirds had relapses later in life. The longer the interval since birth without symptoms the less likely is the skin to show lesions, and the more likely are enlarged tonsils, and nerve symptoms to be present.

Clinical Tuberculosis of Infants.—J. Cassel (*Arch. f. Kinderheil.*, Bd. lx–lxi, 1913) in the Kinderasyl of Berlin collected 1282 cases in seven and a half years, out of which seven had active tuberculosis, all fatal. Out of ninety-five who died, 7 per cent. died of tuberculosis. The ages at death were six months to one year. Four came from tuberculous homes, two did not. The chief symptoms were fever and loss of weight; no bacilli were found in the sputum of any of the cases. In two autopsies cavities were found; in one adhesive pleurisy; in one empyema; in six tuberculous bronchial glands; in one tuberculous glands in the abdomen; in one tuberculous ulcers of the duodenum and jejunum.

Papulonecrotic Tuberculides in Infants.—Papulonecrotic and papulosquamous tuberculides are described by Hamburger as small, round, slightly raised, rather hard, flat papules ranging in size from a pinhead to a millet seed, of red to reddish-brown to livid brown color, often presenting on their surface a small dry crust which is easily removed, leaving a whitish, central depression with occasionally a small bleeding point in its center. If put on the stretch they have a glistening appearance. The lesions generally appear in crops and heal spontaneously in from four to eight weeks. B. M. Wronker (*Amer. Jour. Dis. Child.*, 1913, v, 447) records nine cases of infantile tuberculosis in which the diagnosis was first made by the finding of papulonecrotic tuberculides. He says that these skin lesions are absolutely characteristic, and when once seen are not easily confused with other conditions. They are of extreme diagnostic importance, especially in infancy when the clinical diagnosis of tuberculosis is notoriously uncertain. The majority of cases in infants are indicative of general miliary tuberculosis. The prognosis is generally bad, but not always fatal. The v. Pirquet reaction is a great aid in clinching the diagnosis. A negative reaction, however, must not be allowed to mislead one in the presence of papulonecrotic tuberculides.

Meningitis of the Epidemic Type in Infants below Two Years of Age.—H. Koplik (*Jour. A. M. A.*, 1913, lx, 1755) says that the most difficult cases of meningitis to diagnose before lumbar puncture are those in infants complicated with pneumonia. In the very young we should never lose sight of the possibility of meningitis. A day's delay in older children is not dangerous; but the same delay in a baby may mean its loss. The stress of diagnosis must be placed on the persistence of cerebral symptoms, high fever and Macewen's percussion note over the frontoparietal juncture as a sign of increasing fluid in the head. The younger the child the more difficult it will be to come to a definite conclusion as to increase of fluid in the ventricles, for in rachitic infants a Macewen percussion note is normal. A tense fontanelle is of some value, but not always, for some children will mislead the most expert when a crying spell is present. The earlier the injections of antimeningococcic serum are given, the more certain are the results. Some cases cannot be reached by the serum. Among the causes which account for the high mortality are the virulence of the infection and the fact that quite early at the outset in many infants the subarachnoid space at the base of the brain is cut off from that of the cord, with the result that lumbar puncture with introduction of serum becomes fruitless quite early—on the second or third day of the disease in some infants. In infants below two years of age, in whom meningitis is suspected, an early lumbar puncture should be made so that the treatment may be begun as soon as feasible. In these young patients fluids should be withdrawn slowly and with the greatest caution and the serum be introduced very slowly in order that traumatism and extreme changes of pressure be avoided. In young patients the temperature is a guide of great value as to the necessity of repeated puncture and introduction of serum as in older children, but in face of great restlessness and a normal temperature fluid should be withdrawn by lumbar puncture and examined for bacteria. If these persist and a cloudy fluid is obtained, it is safe to reintroduce serum rather than delay and wait for actual cultures to determine whether or not such fluid is sterile.

Diphtheritic Paralysis.—J. D. Rolleston (*Arch. Pediatrics*, 1913, xxx, 335) has kept records of 2300 completed cases of diphtheria. Of these, 447, or 20.7 per cent., showed some form of paralysis; 184 were severe and eighty-five were fatal. There exists a close relation between the severity of the acute attack and the subsequent paralysis. Of the 216 very severe cases five died of toxemia before any paralysis developed and all but thirteen of the survivors had some paralysis. Paralysis was found to be much more frequent and severe in cases in which the nostrils were involved as well as the throat than in those in which the fauces alone were affected. No paralyses followed any of the twenty purely laryngeal cases. Of the 2300 cases, thirty-one, or 1.3 per cent., had relapses. Two of the thirty-one had palatal and ocular palsies after the first attack, but none showed any paralysis after the relapse. This absence of any paralysis is an evidence of the invariably mild character of relapses. Paralysis is more frequent in children than in adults, the great majority occurring between two and six years of age. Early injection of antitoxin undoubtedly jugulates the disease and tends to diminish the occurrence of subsequent complications. The only palsies which occur during the first fortnight of the disease are cardiac and palatal paralysis. Disturbance of the heart's action may occur at any period of convalescence from diphtheria, but no cases of so-called cardiac paralysis in this series proved fatal in which the symptoms had not developed before the end of the second week. Precocious paralysis of the palate, revealed by a nasal voice and less frequently by regurgitation of fluids through the nose, occurs in the first fortnight of the disease. Like cardiac paralysis it is almost invariably associated with malignant forms of diphtheria. In the present series ocular paralysis never occurred before the third week and only exceptionally before the fourth. In addition to the early use of antitoxin which is the best means of preventing paralysis, rest in bed in the recumbent position for a period varying with the severity of the initial angina should be enforced. In mild cases the patient may be allowed to sit up by the end of the third week and two days later to leave his bed. In severe cases it is advisable not to let the patient sit up before the end of the sixth week and then only if no paralysis has developed. If by the end of the seventh week there be no other paralysis but that indicated by a nasal voice, defective accommodation or an irregular heart, the patient need not be kept in bed. In cardiac paralysis, and paralysis of the pharynx and diaphragm active measures are required. In all severe cases the prophylactic administration of adrenalin either by mouth or subcutaneously yis of service to forestall or combat suprarenal insufficiency. In pharyngeal paralysis, owing to the anesthesia of the larynx and the risk of deglutition bronchopneumonia makes it advisable to substitute rectal feeding. The loss of motor power in the lower limbs which is most likely to be met with in cases convalescent from pharyngeal palsy is not usually of long duration. Except in cases of hemiplegia, electricity and massage are rarely required.

The Syndrome of Little.—Luigi Concetti (*Arch. f. Kinderheil*, Bd. lx–lxi, 1913) contends that we should speak not of Little's disease but of Little's syndrome, since the disease is so varied and from such various causes. Many lesions are described under this head. It was considered by Little as a congenital malady resulting from difficult labor. Autopsy has shown it to be due to hemorrhage in these cases, generally caused by the rupture of the longitudinal sinus, the blood from which descends along the fissure of Rolando and destroys a variable part of the convexity and the motor areas. If it descends only part way to the base of the skull the legs are especially affected; if lower, the arms are involved, and lower still the face and speech centers. Thus we may pass in a succession of cases from a slight permanent hypertonia to a spastic paraplegia, involving the upper or lower extremity or the face, or disorders of speech. If the frontal and parietal lobes are destroyed and small cyst formation takes place in the sensitive and sensorial zones, in the fibers of projection and association we thus can explain the convulsive and choreiform phenomena noted and the psychic complications. Another factor found at autopsy is a failure of development of the pyramidal tracts in the medulla and in the spinal cord. The cells and fibers in the brain having been destroyed at birth, the fibers in the tracts, which are not yet myelinized remain undeveloped, myelinization never takes place, and the neuron cannot acquire its function of transmitting cellular energy. Formation may be only retarded and the special reparative forces of nature may later cause development to proceed, and thus lead to gradual improvement. Clinical symptoms are spasm, contracture, exaggerated reflexes, predominance of the activity of the spinal cord, separated from that of the hemispheres, and with a tendency to improve from below upward. If the disease had begun in later life there would have been degeneration of the fibers, not failure to myelinize, and paralysis would predominate over contracture. But in Little's syndrome paralysis is not so marked, spasm is more so. New observations have shown similar cases to exist after premature birth, from retardation of development of the pyramidal tracts, and congenital lack of cerebral influence on the medullary nervous system. This condition may also be produced in birth at term by the presence of hereditary dystrophies such as syphilis, tuberculosis, alcoholism, etc. Oppenheim has described a similar syndrome in which the congenital defect is in the peripheral medullomuscular neurons, resulting in atony instead of spasm. The conception has been extended to all causes at birth or soon after labor which have prevented complete myelinization of the fibers, such as meningoencephalitis, tumors, hydrocephalus, hemorrhage causing hemiplegia or monoplegia, syphilis in the new-born, vascular lesions, cystic formations, thrombosis, trauma, etc. Here the symptomatic manifestations are not regular and typical, and vary with the kind and extent of the lesion. Fetal meningitis and meningoencephalitis may cause the most various symptoms, according as the cortex was more or less affected. In other cases, after a normal birth, some infectious disease soon attacks the child and during the convalescence the syndrome of Little develops. In these cases symptoms such as convulsions have shown meningeal irritation, or meningoencephalitis. If soon after birth we get agenesia, failure to myelinize, there is contracture. If it occurred later in life there would be degeneration; flaccid paralysis at first, and later contracture. The essence of the lesion is agenesia, failure to myelinize, lack of cerebral action, and predominance of spinal action in the nervous system. The special lesion is always in the pyramidal tracts, and secondary to cellular alterations in the superior portion of the neuron. Integrity of the motor part of the spinal cord accounts for the lack of atrophy and absolute paralysis. Accessory phenomena, convulsions, and choreiform movements are accounted for by irritation of the brain from residual remains of inflammatory processes, vascular changes, connective tissue proliferation, or cicatricial remains in the meninges, and these are lacking in true congenital cases. Typical cases result from difficult labor; premature labor predisposes to paraplegia; dystocia to general rigidity with accessory phenomena and convulsions. The author records eighty-two cases with five autopsies.

Pathogenesis of Casein Curds in the Stools of Infants.—A. F. Hess (*Amer. Jour. Dis. Child.*, 1913, v, 457) presents a study of this subject, showing that the large bean-like masses in the stool are curds which contain casein, and are formed in the stomach. The fact that they show no bile coloring matter in their interior goes to prove that they are moulded before they reach the level of the duodenum where the bile is poured into the intestine; the additional fact that they disappear when the food is introduced by catheter directly into the duodenum, and reappear when it is once more given by mouth, must be accepted as strong evidence toward this conclusion. We wish to lay emphasis on the observation that certain infants are peculiar in their tendency to pass the curds with slight intermissions for months, whereas other infants similarly fed pass stools normal in this respect. This shows that in studying the pathogenesis of this condition we must take a clinical as well as a laboratory point of view, and must consider the individual infant and not merely the chemical factors with favor or hinder the coagulation of milk in the stomach. There are some infants who produce larger and firmer curds in their stomachs, due either to the amount of rennin which they secrete, or to the abnormal conditions under which the enzyme acts on the milk. These larger masses were found in the stomach and also in the duodenum of infants who passed casein curds in the stools. Ordinarily, the milk curd is pressed from the pyloric curd of the stomach into the duodenum in the form of slender, compact "food strings," which may be termed *pyloric casts*. In the cases with curds in the stools, the catheter showed the duodenum to contain larger masses. The curds indicate the nondigestion of casein masses. The intestinal disturbance which at times accompanies the appearance of these masses in the stool, may be of gastric origin, or of the same origin as the disturbed gastric function; it is not caused by the curds, nor is it the cause of the curd formation. Diluting milk with barley water does not check their formation, nor does pasteurization to 147° F. for forty-five minutes, a process which complies with the ordinances of the health departments of various cities. Pasteurization to 170 or 175° F. causes the curds to disappear to a large extent, and therefore may be said to render the milk more digestible in these cases. The curds should not be allowed to persist, but should be checked, either by a high degree of pasteurization or by boiling the milk.

Mocarditic Syndromes in the Course of Acute Infections in Children.—P. Nobécourt (*Jour. de méd. de Paris*, No. 23, 1913) says that the modern knowledge of the functions of the suprarenal bodies and hypophysis has changed our ideas with reference to the production of heart symptoms in acute infectious diseases of children, and their relation to the circulatory apparatus. In latent form cardiovascular troubles may give no symptoms at all, though physical signs show changes in the size and action of the heart and in blood pressure, and sometimes a slight increase in the size of the liver. Cardiac dilatation in rheumatism is not always associated with inflammation of the serous lining of the heart. The heart sounds are feeble, the second pulmonic sound is accentuated, and there may be galop rhythm, and a systolic murmur at the apex. This dilatation may be only transitory or it may persist for some time. It may also appear in chorea, scarlatina, typhoid,and some of the lesser infections. There occur also variations in cardiac rhythm, tachycardia, bradycardia, arrhythmia, and arterial hypotension. There are also cardiac forms of these diseases, properly so-called, in which the symptoms are most severe and the prognosis is generally fatal, the malignant forms of endocardial rheumatism. The symptoms are dyspnea, cyanosis, congestion of the pulmonary bases, and edema in various locations. The heart dilates, there is tachycardia, and frequently sudden death. In scarlatina endocardial troubles may begin early in the disease; in diphtheria they generally occur later; in typhoid they usualy begin at the third week. At autopsy one finds in acute rheumatism an acute parenchymatous myocarditis, interstitial myocarditis being exceptional. In typhoid the myocarditis is parenchymatous or diffuse; in diphtheria it is of the parenchymatous type. In these infections there occur syndromes of suprarenal insufficiency characterized by asthenia, abdominal pains, small pulse, and low arterial tension. Another cause of cardiovascular changes may be meningoencephalitis; a third may be nephritis. In general these troubles are less severe in children than in adults since the heart has not been subjected to the influence of alcohol, intoxications, diathetic maladies, and multiple infections.

Acute Pericarditis in Children.—P. Nobécourt (*Jour. de méd. de Paris*, No. 19, 1913) says that inflammations may be localized on both the serous membranes of the heart, internal and external. Acute pericarditis does not occur equally at the different periods of childhood. They are not rare in the new-born and during the first year of life; the frequency diminishes up to the age of five or six years, and then increases to fifteen or sixteen years of age. They are serofibrinous in larger children, purulent in younger ones, in whom there is less resistance to the pathogenic germs, and in whom the germs are easily disseminated by the lymphatics from the endocardium to the pericardium. In new-born infants purulent streptococcic pericarditis arises in the course of septicemia of puerperal origin, the infection entering by the umbilical cord. It is generally associated with phlebitis of the veins of the cord and suppurative peritonitis. In older children, especially at about five years of age, pneumococcic pericarditis occurs. Streptococcic or staphylococcic pericarditis may result from osteomyelitis, abscess, impetigo, stomatitis, or enteritis. In infectious diseases the streptococcus causes secondary infections of the pericardium. In rheumatic pericarditis an exudate covers the surface of the heart and adhesions form. In tuberculous pericarditis there is a fibrinous exudate, sometimes hemorrhagic. In pneumococcus the pus is thick and creamy and the two layers become adherent. When there is streptococcus infection the exudate is liquid and seropurulent. Rheumatism furnishes the best examples of dry and serofibrinous pericarditis. The symptoms of pericarditis are pain, increase in size of the cardiac dulness, a sharp friction sound at the base of the heart and around the arterial trunks, which is generally double, superficial and which disappears when the liquid increases and returns as it is absorbed. Dyspnea, cyanosis, and rapid pulse are characteristic. The area of cardiac dulness is increased and the beat enfeebled and displaced upward and inward. Purulent pericarditis causes less marked symptoms. Both endocarditis and pericarditis are more frequent in children than is ordinarily supposed, therefore their physical signs should be sought for in any infectious disease whether symptoms are present or not.

Treatment of Rachitic Deformities.—Max Böhm (*Arch. f. Kinderhail.*, Bd. lx–lxi, 1913) considers the modern methods of treatment of rickets, surgical and orthopedic, in cases of deformity. By the absorption of the lime salts from the bones a lime-poor osteoid material takes the place of the normal bone, and lesions of the bone forming zones causes them to broaden, while the epiphyses become irregular, and bony growth takes place beneath the periosteum. The bones contain less calcium and phosphorus than normal, and more water. Later the osteoid bone becomes sclerotic and eburnated and the bone abnormally brittle. The cortex is thick and the canal narrow. The deformities thus created tend to gradually become corrected spontaneously even up to the age of eight or nine years. Knock-knee shows little tendency to correction, while bow-legs are often repaired by nature and growth. Vertebral curvatures show no tendency to correction. As far as orthopedic work is concerned there are three stages in rickets; first the stage of formation of deformity when no surgical or orthopedic treatment should be undertaken, but medical and hygienic measures have their place. The second is the stage of sclerosis and confirmation of deformity. The third is that of natural repair of deformity. The duration of the period of repair is very variable; surgical treatment should begin only when repair has ceased. Treatment now may be given by forced replacement, by osteoclasis, and by osteotomy. In slight cases of knock-knee and bow-legs forced replacement with plater splints may be effectual. In severe ones osteotomy is to be preferred to osteoclasis. No shortening is produced, a plaster splint is worn for ten days, then the stitches are removed, overcorrection is made if necessary, and a new plaster splint is applied and worn for five weeks more, the entire treatment taking six weeks. Then massage and gymnastics may be used for a short time. The results are invariably good as is shown by the author's cases. Spurious coxa vara, from bending of the upper portion of the shaft, may be cured spontaneously. True coxa vara requires operation. All these operations are made through a small skin incision and are practically bloodless and subcutaneous. We may do an osteotomy and change the angle of the neck and shaft, cutting the neck two-thirds through, and fracturing the rest. It is then put up in plaster in a position of extreme abduction for ten days to six weeks. Genu valgus requires operation, varus does not. Operation is done on the femur above the knee, two-thirds being sawed through, the remainder fractured, and the usual plaster dressings being put on, the first for a week, the second for five weeks. Prophylactic treatment in rachitic children comprises not allowing the child to sit up, and placing him in a lordotic position in plaster, with the legs raised backward, and the child on its stomach. When plaster casts are put on in this position the child is carried about thus and the cast removed only for bathing. Lumbodorsal scoliosis causes many of the spinal curvatures that are seen in the school child. It is generally recognized too late to cure it, after a compensatory curvature has occurred. All hope of cure is from early treatment by correction with plaster. In older cases the corset is useless and gymnastic exercises give the only hope of repair.

Infantile Cerebrocerebellar Diplegia of Flaccid, Atonicastasic Type.—L. P. Clark (*Amer. Jour. Dis. Child.*, 1913, v, 425) records a case of the affection which he terms infantile cerebrocerebellar diplegia. He says that it is a relatively rare disorder which has largely an unknown intrauterine causation, but which results in a permanent disablement of the motor functions of the cerebellum and forebrain, resulting in a state of mutism and idiocy accompanied by atonia, astasia, dysmetria, incoordination and a generalized palsy in effect. He believes it constitutes a distinct type of palsy of infancy. The disorder not only affects isolated movements, but particularly the *association* of movements or the motor synerges so-called. The movements by themselves as shown in the type are not incoordinated as in tabetics, but are characterized by dysmetria and discontinuity. Whenever the child's movements relate to the maintenance of an attitude, especially in sitting or standing, there is instability, wavering from side to side, or astasia. The children show great disturbance of the reactions to equilibration, due to the fact that the defective cerebellum fails to effect and hasten the reestablishment of equilibrium, much the same way as it fails to make isolated movements precise and regular. Again, the defective cerebellum fails to apportion the measure and the continuity of movement. There is instability and imperfect reactions to equilibration by a special tonic action. This latter function is co-governed by the cerebrum and to some degree by peripheral stimulation. The defect in cerebellar function shown in hypotonia is not compensated for by a diseased cerebrum. The latter organ being unable to substitute or take up the cerebellar function there results a persistent dominance of hypotonus throughout the life-picture of this type of palsy. The suppression of the cerebellar functions in this disease does not produce a palsy *per se* as ordinarily understood. Motility of the limb remains. It is never abolished entirely, as some movements or attempts at equilibration probably remain because some degree of substitutional power of the cerebrum is still possible; the greater part of its loss is, however, largely in evidence. Citations from the literature are held to prove that (1) unilateral agenesis is compensated for by the remaining intact lobe, and (2) that bilateral agenesis may be compensated for by the cerebrum. Evidence is not yet forthcoming to show in cases like the author's in which agenetic defect of both cerebellum and forebrain is postulated to exist, in what way the multiple lesion is induced, whether the cerebellum or the cerebrum suffers the initial damage or whether both are simultaneously injured, and how.

Asthma in Children.—E. B. Smith (*Practitioner*, 1913, xc, 924) has kept notes of thirty-six out of forty cases of asthma in children under twelve years of age. These show that it affects the sexes about equally and that the history of heredity is marked. The dry, adult type, with its intense dyspnea is not common before five years of age; but there is a distinct type of infantile asthma which may commence almost as early as birth. Of the thirty-six cases, thirty-four parents could tell when the first attack occurred. No less than twenty, or fifty-eight per cent., had their first attack within the first twelve months of life. There are two distinct types to be met with in children. One may be said to affect children between birth and five years, and the second, which closely approximates to the adult type of the disease, generally makes its appearance between five and puberty. These may be described tersely as a moist and a dry asthma, for, in the first group, the predominant feature in a great number of cases is the accompanying or following bronchitis; while in the second group, though cough and bronchitis may be present in some cases in a varying degree, the dyspnea is undoubtedly the more prominent feature. The paroxysm occurs at any time of the day or night, but there is a distinct predilection for the early hours of the morning. If a history of recurrent attacks of dyspnea in the early hours of the night is obtained, one is much more frequently dealing with laryngitis stridulosa rather than with real asthma. In the infantile type, a paroxysm occurs, is followed by bronchitis which clears up, and another attack occurs in due course. In some cases, however, the attack of bronchitis is not over, before another attack of asthma appears, and, in this way, many of these children remain in a state of chronic asthma and bronchitis. These cases will be found the most unsatisfactory to treat. Many cases, especially those that start in infancy, seem suddenly or gradually to cease after three or four years; some apparently with treatment, others with no treatment at all. Cases that start in infancy are said to be more inclined to cease early than those starting in the second period of childhood, while those which start at the second dentition are more amenable to treatment than those that start at puberty, and in later life. If the paroxysms are frequent and persist, there is a risk that changes will ultimately be induced in the lungs which will undoubtedly tend to shorten life. Permanent emphysema, as a result of asthma, is not common in children. Whatever view is taken of the mechanism which leads to the characteristic dypsnea, one will be compelled to accept the idea that, primarily at all events, it is the nervous system which is at fault. The proper comprehension of this underlying nervous factor is the key to all proper treatment of these cases. Where there is a predisposition to asthma, the presence of adenoids or any other lesion of the upper respiratory passages, or an unhealthy state of many other parts of the body may give rise reflexly to an asthmatic paroxysm. Regulation of the bowels in a case of chronic constipation may effect a cure when iodides, belladonna and other antispasmodics have failed. The rickety and ill-fed baby with an asthmatic inheritance will have repeated attacks until the rickets or the diet is corrected. On the other hand, a permanent cure should not be promised when removing adenoids or cauterizing septums. If the attempt to relieve the patient by the careful elimination of all possible sources of irritation has failed, and a suitable habitat has not been found where he or she is free from attacks, it will be necessary to fall back on drugs as a last resource.

Accidents Following Subdural Injection of Antimengitis Serum.—Simon Flexner (*Jour. A. M. A.*, 1913, lx, 1937) says that the severer types of accidents thus far reported have been variously attributed, first, to anaphylaxis; second, to rapid lysis of the meningococci; third, to excessive intracranial pressure; and fourth, to poisoning by the phenol preservative sometimes present in the serum. The fourth possibility, brought forward by S. P. Kramer to explain several unfortunate results which came to his attention in connection with the administration of the antimeningitis serum in the Cincinnati Hospital, is ruled out by several facts. Serious symptoms, recalling those described by Kramer, have followed the administration of Dopter's serum, which contains no phenol. The injection of phenolized serum into the lateral ventricle is borne quite as well as its usual injection into the lumbar meninges. There does not exist a more direct path to the fourth ventricle than that of the cerebral ventricles. If, therefore, the mere presence of the phenolized serum within the fourth ventricle in children sufficed to bring about severe poisonous effects we should look for such a result from the intraventricular injections. And yet, not only has this not happened, but the latter injections have proved in several remarkable instances to be life-saving. The accidents, moreover, have not been limited to children but have been observed in adults in whom a patent central canal of the spinal cord, if it exists at all, must be an extremely rare occurrence. Since, in some of Kramer's cases the severe symptoms did not arise on the first injection, but on the second or third injection of the serum, given in close succession, it is quite certain that anaphylaxis played no part. There remain, therefore, two possibilities; that the severe effects were caused by toxins liberated by the immune serum from the meningococci, which then must have been present in large numbers, or that they were the result of excessive intracranial pressure. That they were not caused by meningococcus toxin is shown by the fact that in some of the reported cases the cerebrospinal fluid removed contained either few micro-organisms or even none that were demonstrable in microscopic preparations. The number of accidents reported by Kramer, contrasted with Sophian's 1500 injections without an accident, suggests some local cause. Apparently the doses employed by Kramer were maximal and they were given with a syringe instead of by the safer gravity method. The indications are that either in all the instances or in practically all, excessive intracranial pressure was the source of the accidents. It is not justifiable to withhold the remedy in spite of some small risk, in view of the far greater dangers to which the patients are exposed by the disease itself. Nor is it always possible to ascribe serious symptoms to the serum even when they follow closely on the treatment. Sudden death in epidemic meningitis is a not infrequent occurrence; and cases have even been reported in which death has taken place while the physician was engaged in getting ready to make the serum injection and even before lumbar puncture had been performed.

Scarlet Fever and the Ear.—Paul Manasse (*Monatsschr. f. Kinderheil.*, Bd. xii, No. 2, 1913) says that scarlet fever may attack any part of the auditory apparatus, middle ear, labyrinth, or nerve, separately or combined. In middle-ear trouble the author distinguishes a simple form occurring early or late in the disease similar to that usually seen in catarrhal cases, and a severe form. The true specific ear disease of scarlet fever is necrotic. It is diphtheritic in character and its prognosis and treatment is quite different from that of ordinary aural catarrhs. In the necrotic form the membrane and bones of the ear rapidly necrose, seaming to melt away; the facial nerve is often paralyzed, and complete deafness is liable to result. Some hearing may be retained even in this form. There may remain a dry perforation, or a chronic catarrh, purulent and fetid. In such cases hearing becomes worse, secondary cholesteatomata form, and there may be intracranial complications and sinus thrombosis. Treatment must be first prophylactic, preventing the inflammation from reaching the ear from the throat, by careful disinfection. If the mastoid becomes involved operation becomes necessary early. Into the labyrinth the infection spreads through either foramen, rotundum or ovale, even with intact membrane. The inflammation may be serous or purulent, and may affect the organs of Corti or the nerve fibers, which change into necrotic masses. This condition is called panotitis. The symptoms include disturbance of hearing or deafness, and disturbances of equilibrium, such as dizziness, staggering, tendency to fall toward the affected side and vomiting. The whole labyrinth may slough out. The results in the serous or the circumscribed form may not be very bad, but in the diffuse and labyrinthine forms deafness is generally complete, and speech is often lost also, even if the child is seven or eight years old. Affection of the nerve itself may result without otitis. This form of deafness is not easily differentiated from the labyrinthine form. The prognosis is bad.

Treatment and Prophylaxis of Measles.—H. Roueche (*Jour. de méd. de Paris*, No. 22, 1913) says that measles, being a contagious disease, should be limited in its spread. Secondary infections, especially bronchopneumonia, laryngitis, and otitis, should not occur. Sequelæ also should be prevented since measles is one of the diseases that is most likely to be followed by tuberculosis. Starting with these premises the author seeks to show what measures we should employ to prevent the spread of measles. Since the incubation of the disease is so long isolation of the patient is useless, for the contagion has occurred before the child can be separated from his fellows. Rather isolate the children and the adults who have been in contact with the patient. This isolation should last from fifteen days to two weeks. Especially should we isolate every child who shows an acute catarrh of the nasopharynx, who coughs, sneezes, and has red eyes and running nose. In schools and asylums isolate the patient and all his companions at the same time. Isolation *en masse* is murderous. Each child should be placed in a separate isolation box until the diagnosis is complete. Disinfection in families is generally useless because the cause loses its vitality very early in the disease. In complicated measles isolation and disinfection are both useless. As to treatment, the hygiene of the child should be carefully supervised. Food should be liquid; the mucous membranes should all be carefully disinfected; the nasal passages with borated or mentholated vaseline or oil, or resorcin 1–50 in oil. The mouth and throat should be washed with boric-acid solution or warm Vichy water; the vulva, with a weak solution of permanganate of potash. In diarrhea, bicarbonate of soda should be given in small doses. There should be daily full baths and all skin erosions should be treated with zinc oxide ointment. The medical treatment may be reduced to quinine, acetate of ammonia, and bezoate of soda. This stimulating and revulsive medication is sufficient for all cases of uncomplicated measles. In the nervous adynamic form we have to combat the hyperpyrexia and typhoid state. Warm baths every four hours give remarkable results. The hemorrhagic form required stimulants and administration of calcium chloride. In dyspnea the cold bath gives good results. In bronchopneumonia hot baths should be given to produce vasodilatation and quiet the heart. In suffocating catarrh the bath is badly tolerated, and wet cups give the best results. All such cases should be carefully followed up to avoid later tuberculous infections.

Vaccination Against Tuberculosis.—Having been associated with Karl von Ruck in the application of his method of prophylactic immunization to tuberculosis of 262 of the 339 children reported upon by von Ruck, C. A. Julian (*Med. Rec.*, 1913, lxxxiii, 1059) reports his observations on the practical side, including the results of recent examinations after a period of fourteen months since they were vaccinated, and adds like observations in 131 additional vaccinations made by himself. He considers the influence of the method upon children who were known to have or were suspected of having acquired a tuberculous infection prior to their vaccination. The writer's observation of degrees of local and general changes for the better, with complete restoration of the general health in all cases of suspected or manifest tuberculosis, which clinicians as a rule agree to accept at least as evidence of complete arrest if not of an apparent cure, justifies the assertion that, even from a most conservative standpoint, there has been an undoubted relation between the vaccination and the results shown, and that the method has resulted beneficially to these children in a degree and with a uniformity which we have not been accustomed to witness heretofore, a conclusion all the more justified by the fact that there has been no change in the mode of life, environment, or in dietetic, hygienic measures, and that no other treatment of medication designed to aid in the realization of the results has been resorted to.

Malted Food in the Treatment of Enteritis in Young Children.—S. Veras (*Brit. Jour. Child. Dis.*, 1913, x, 307) has found malt soup the best antiputrefactive diet in the enteritis of children. In a case of enteritis he starts with water diet, and sometimes continues with vegetable broth and then very rapidly reaches malt soup. But instead of at once resorting to malt soup prepared with milk, he starts with malt soup prepared with pure water, employing 900 gm. to a liter of water, instead of 600 gm. of water and 300 gm. of milk. The following day he gave malt soup prepared with milk, alternating each meal with malt soup without milk. Tolerance to milk becomes established and never offers any difficulty. During the hot weather it is well to keep the soup in an ice chest, or, better, to prepare it twice a day. He makes it by a simplified form of Terrien's method. A packet containing 20 gm. of freshly prepared malt is poured into a large glass containing about one and a half inches of water. The water, which has been previously boiled, must be kept at a constant temperature of 60° C., *i.e.*, one which can just be borne by the little finger, and placed in another receptacle of warmer and frequently changed water. Then take three large tablespoonfuls of rice flour and mix in 600 gm. of water and 300 gm. of milk in the cold. Put the mixture on the fire and stir to prevent lumps forming. When it has begun to boil take it off the fire, and after about a minute quickly add 50 gm. of sugar, and then strain into it the malt infusion, still kept at the previous temperature. This malt soup can hardly be given until after the age of five months and is contraindicated in younger children, whose stomach would not always tolerate ice cream even when diastased. With children under five months, instead of rice meal the writer uses a decoction of rice passed through a fine cloth, and treated with diastase according to the same technique. For a large glass (300 gm.) of rice decoction, 15 to 20 gm. of sugar and 10 gm. of malt are used; milk is then gradually added to the decoction according to the toleration of the child.

Breast-feeding.—What little is accurately known of the quantity of human milk needed by an infant and how the maternal supply may be controlled is largely drawn from a comparatively few observations on the consumption of breast-milk. Most of these are merely estimates of the size of single feeds—the so-called "test meals"—and the daily total is calculated by multiplying the size of the test meal by the number of the daily feeds. The most systematic attempt on a large scale was made by Pritchard, Carter, and Pitt, and their results stand as a guide to breast-feeding among the poorest classes, D. Forsyth's (*Lancet*, June 14, 1913) observations comprise a continuous estimate of the consumption of breast-milk by an infant of the better class from the fifth day after birth, when the supply of maternal milk began, until the forty-ninth day. During the period of the experiment 413 breast feeds were given, the daily number varying from seven to eleven and averaging nine. Immediately before each meal the infant was put in the scales, and again immediately after, except on a few occasions. Perhaps the most notable feature of these observations is the variability in the consumption of milk. No diurnal cycle of activity of the mammary glands could be traced, the biggest and smallest feeds occurring at any hour of the day or night—a fact which also excludes such periodic maternal influences as meals, sleep, and fatigue. It is no easier to place the responsibility on the child, though it might be suggested that, being hungrier at one time than another, he was able, by the vigor of his sucking, to regulate the supply according to his needs. In favor of this it was noticed that a contented sigh of repletion was no less frequent after a light meal than after a heavy—*i.e.*, that the small feeds were all that was wanted at the time. Against it is the fact that a full meal took no longer than a scanty, which seems to show that at one time the supply was more abundant than at another. Moreover, he occasionally showed temper soon after being placed at the breast, grunting and biting the nipple viciously, from which it might be inferred that at these times he found his cupboard barer than he liked. The writer's impression is that the secretion, though becoming ampler with the growth of the child, and to this extent, therefore, being regulated by the demand, varied from day to day and from hour to hour under the influence of unknown maternal factors. Whether she is fed generously or moderately, drinks much milk or little, takes or abstains from oatmeal, stout and other reputed galactagogues, no reasonably scientific proof is yet forthcoming that these measures affect the activity of the mammary glands. Only a small minority of the feeds were of the average size as calculated at the end of the day; in other words, any of the majority of them, if accepted as a test meal, would, on being multiplied up, have shown too high or too low a daily average, and a large number of them would have given altogether misleading results. The observations, to be trustworthy, must be continued for at least twenty-four hours on end, and ought to cover several days together.

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ORIGINAL COMMUNICATIONS.

PRESIDENT'S ADDRESS.[1]

BY
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Fellows of the American Association of Obstetricians and Gynecologists.

THIS is the first meeting of this Association in the state of Rhode Island, and to me it seems that it is especially fitting that we should meet here. Indeed, I wonder that we have not, forced as it were by an irresistible impulse, met here long before this. Because from its birth Rhode Island has been known as the "home of heretics."

Rhode Island is the birthplace of the referendum, the cradle of democracy, and the kindergarten of equal suffrage. Here Roger Williams preached the heresy of voluntary contribution to and attendance upon the church; also the separation of church and state, and, actually, had the audacity to advise the purchase of the land from the rightful owners, the Indians, rather than accept a charter from a king whose title, it was assumed, originated in Divinity.

A heretic is a man whose ideas and opinions are far in advance of the multitude. Master minds are scarce and so, naturally, the "home of heretics" is small—hence "little Rhody." And so I say, it seems a wonder to me that this Association did not gravitate here long before this, because it is the child of heresy. Conceived, born and nursed to vigorous maturity by the splendid heresies of McDowel and Richmond, the Atlees, Dunlap, Tait and Price. With these thoughts in mind, will you permit me to present the theme of this address in the words of another heretic—Kipling?

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

When Earth's last picture is painted, and the tubes are twisted and dried,
When the oldest colours have faded, and the youngest critic has died,
We shall rest, and faith, we shall need it—lie down for an æon or two,
Till the Master of All Good Workmen shall put us to work anew.

And those that were good shall be happy; they shall sit in a golden chair;
They shall splash at a ten-league canvas with brushes of comet's hair;
They shall find real saints to draw from—Magdalene, Peter, and Paul;
They shall work for an age at a sitting and never be tired at all!

And only the Master shall praise us, and only the Master shall blame;
And no one shall work for money, and no one shall work for fame,
But each for the joy of the working, and each, in his separate star,
Shall draw the Thing as he sees It for the God of Things as They Are!

By making me the president of this body you conferred upon me at once an honor which I sincerely appreciate, and a responsibility which, though met not without fear and trembling, shall be met none the less squarely and borne to the best of my ability. The past year has been one of as great activity in medicine as any of the past, and the achievements have been equally great though, perhaps, not quite so tangible. I wish, in this address, first to direct your attention to the more important work of the year. Work that concerns the Fellows of this society in their daily efforts of healing the sick and relieving the suffering. Second, I want to say a few things concerning the work of the profession along the lines of the conservation of human life and energy, particularly the part of the work which should engage the Fellows of this Organization. Third, I am going to assert my prerogative and make some suggestions. Inasmuch as my remarks are largely suggestive, I shall make no attempt to give complete and definite references to the literature upon which I have drawn.

THE YEAR'S WORK.

Obstetrics.—Abderhalden's test for pregnancy has been tried in various clinics with varying results. According to Veit, Rosenthal and Markus, the test is positive. Schwarz of St. Louis and Judd of Baltimore also report favorably upon the test. Williams and Pearce, however, found it unreliable. In a word, it may be said that the reports from continental clinics of Europe are generally to the effect that the test is reliable; while many investigators, in this country and Great Britain, have reported adversely upon it. That the test requires great skill and accuracy is beyond question. Work is being done now, in the Jewish Maternity of New York, by Gutman and Bruskin with a view of simplifying the technic to make the test easier of application.

It should not be forgotten that the reaction remains positive for about two weeks after the termination of pregnancy at term, or after an abortion.

Stroganoff advises the early "getting-up" of patients after confinement, basing his conclusions on 11,000 cases of which 800 were primiparæ. The primiparæ were allowed to get up on the third and the multiparæ on the fifth day. His mortality was 0.08 per cent. from sepsis, and 0.11 per cent. from nonseptic conditions. He had but three cases of thrombophlebitis. Primiparæ are allowed to sit up in bed, and to nurse their babies on the day after delivery.

The use of pituitary extract in obstetrics has received quite a good deal of attention during the past year. The action of the drug seems uncertain and, because of this, 0.2 gram should be the initial dose; although 0.4 gram is, usually, necessary to produce decided results. That the drug has the power of producing powerful uterine contractions, is unquestioned; and its use is, therefore, dangerous before there is full dilatation of dilatability of the cervix. The drug should not be used without complete preparation for operative delivery, in case the danger of uterine rupture calls for it. That the drug sometimes produces an increased flow of milk is true; but, it seems, that this is due entirely to its effect on the muscle fibers, and not to any stimulating effect upon the gland tissue. The best method of administration is intramuscular injection.

It is a lamentable fact that the great majority of women do not receive during pregnancy, labor, and the lying-in period, the attention which, with our present knowledge of obstetrics, could be regarded as efficient or safe. Sound public economy and humanity demand that these patients should have the best treatment and care. The reasons why these patients are neglected may be readily stated: The practice of obstetrics does not pay. Ignorance, due largely to ages of improper teaching, as to the dangers of pregnancy and labor; and a consequent lack of appreciation of the dignity of the accoucheur's calling.

Relief from this deplorable situation lies in the direction of educating the public which in course of time will lead the state to provide free, or at nominal cost, to all pregnant women, who care to avail themselves of the offer, the best attention in well-equipped maternities.

Carcinoma and Sarcoma.—Bossi urges gynecologists to prevent the development of cancer by curing all chronic inflammations and avoiding heroic local applications. His contention is that cancer is solely of histological origin and, in most cases, begins in lesions which are not malignant in character but they degenerate into cancer if neglected or when not treated properly. He says true prophylaxis of uterine cancer consists of early systematic surgical treatment of benign affections of the cervix and of the uterine cavity.

Extensive and complete removal of the internal genitalia for carcinoma of the cervix, is growing in favor with men of the largest experience. Kelly (*Johns Hopkins Bulletin*, Aug., 1913) expresses the hope that further simplification and perfection of the details of this operation will, ultimately, reduce the primary mortality of this operation to that of ordinary laparotomy. It is pretty generally conceded that extensive glandular dissection is not justified.

Pagenstecher hopes to be able to enhance the good effect of the *x*-rays in carcinoma by injecting into the tumor colloidal metals. His theory is that the metal injected will give off secondary rays—each particle acting like a Crooke's tube. It may be possible to send this metal to the cancer cells through the blood, by using metals which have a specific affinity for the cancer cells.

Krönig and Gauss recommend, in the use of the *x*-ray, what is known as the Freiburg method. This method differs from the old in that pure gamma rays are used; these rays are carefully filtered through aluminum 3 mm. thick; they greatly increase the dosage and obtain summation of relatively small, single, deep doses by the crossfire method, and permit determination of the optimal time limit and precautions against local injury.

These men have used the new method in 146 cases, and report encouraging results. If, after applying radiotherapy in this way to cancers on the surface for one to three weeks, a cure is not accomplished, an operation can be performed at once. The delay caused by trying radiotherapy is, according to these authors, not detrimental.

The reports from Great Britain, Germany, France and this country, on the use of radium and mesothorium are quite in harmony and encouraging. In inoperable carcinoma, recurrent carcinoma, and after incomplete surgical removal of carcinoma, the use of radium and mesothorium offers hope, because sometimes a cure is obtained and, not infrequently relief from all the symptoms and prolongation of life follows this treatment.

Abbe's paper on the use of radium in carcinoma and sarcoma, read at the recent international Congress at London, (*Lancet*, Aug. 23, 1913) is most comprehensive. It is based on an experience of 750 private cases, covering a period of ten years. Some of the results achieved are really marvelous. Every surgeon should read Abbe's paper.

To summarize, it may be said that radiotherapy, either in the form of *x*-rays, radium, or mesothorium, should be used after all operations for cancer as a prophylactic against recurrence; it should also be employed in all cases of inoperable cancer, because under this treatment some of these cases are rendered operable, sometimes—through rarely—cured, and, as a rule, the symptoms are ameliorated and life prolonged.

In all cases in which it is possible, the growth should be completely removed; if this cannot be done, take away as much as you can, before employing radiotherapy. The rays seem to be more effective when the malignant cells are spread out in a thin layer than when they are piled in large masses.

Jackson's membrane and the various "peritoneal folds," have attracted a good deal of attention during the past year. J. Rilus Eastman and Jackson have written especially valuable papers on the subject. From the knowledge we now have one may, usually, make the diagnosis before operation in cases in which the folds are causing symptoms. Accumulated evidence seems to emphasize the necessity of looking for these "folds" in all laparotomies, and especially when they are found in connection with chronic appendicitis. To accomplish a cure will require, not only the removal of the appendix and the division of the folds, but, in many cases, also the treatment of the coexisting colitis.

The technic of transfusion of blood has been so simplified that we hope to see this very important therapeutic measure used much more frequently than at present. I am especially impressed with the method of Kimpton and Brown of Boston.

The instrument devised by Freund, described in the *Journal of the Michigan State Medical Society,* Sept. 13, 1913, makes the operation of transfusion very easy; it has been used a number of times successfully, and is highly thought of by Vaughn of Ann Arbor. The instrument is, however, more complicated than that of Kimpton and Brown, and it seems there is greater danger from the formation of coagula with its use, than with the Kimpton and Brown instrument. I feel sure that in the future many lives will be saved by this measure that, heretofore, were lost because of the difficult technic of the operation.

Conservation of Human Life.—The medical profession has never undertaken a more glorious work than the Conservation of Human Life and Energy. For want of a better name, we may call it the "*publicity campaign*" of the medical profession. There is no other work which will begin to compare with it in results, when measured in human life, and the efficiency and happiness of mankind.

The American Medical Association, through its Council on Health and Public Instruction, is doing great work in furnishing the people with facts with which they must be made familiar before the needless waste of human life and energy can be checked. Would it not be well worth while for this Association to do what it can to help along with this work?

The Fellows of this Association are peculiarly fitted to help in this cause. Who knows better than you do the ravages of gonorrhea—the mothers' lives it wrecks or takes—how many it robs of the joy of motherhood—and the children it makes blind? Who, better than you, knows the needs of the pregnant woman and of woman in labor? How infrequently those needs are supplied, and why. Who, better than the busy obstetrician, appreciates the causes of the present frightful and preventable infant mortality?

It is the plain duty of every Fellow of this Association to take an active part in this work along the lines of our especial training and interest.

Whether this work is to be carried on independently or in connection with the American Medical Association, is a matter for consideration. I would like to see a committee appointed at this meeting whose duty it shall be to formulate a plan which will make it possible to begin this important work at an early date.

While we have learned much in recent years, we are still woefully lacking in the causes and treatment of the toxemia of pregnancy. I would like to see a committee appointed by this Association whose duty it shall be to study and investigate this subject in all its phases and report its findings annually. The report of this committee should be presented in the form of a paper, given a place upon the scientific program, and should be open for discussion.

There is another subject which seems most worthy of our attention; it is the function of the thyroid gland and its relation to the sexual apparatus—conception, development of the child, health of the mother during pregnancy, labor, puerperium, and lactation. I would suggest the appointment of a committee to study this subject. This Committee should also present an annual report in the form of a paper, subject to discussion.

There never was a time when the medical profession stood so high in public esteem as it does to-day. Nor was there ever a time when the profession was more deserving than now. On the other hand, we are censured by the public as never before and, in a measure, justly so. That we, together with all other professions, trades, and callings, should suffer from the epidemic of "money-madness," is but natural and inevitable. But that we should sit supinely, satisfied in our self-righteousness, and quietly watch the spread of this scourge, is to be false to ourselves, false to our profession and false to the people.

We need an ethical revival! And, if we are to preserve our self-respect, we will furnish the revivalists from our own ranks rather than wait until they are thrust upon us by force of public opinion. I need not tell you that I have in mind the matter of "division of fees," "paying of commissions"—call it what you will, it is graft and 'twill stink to Heaven.

I would like to see this Association place itself squarely upon record in this matter by requiring all applicants for membership to pledge themselves not to engage in this nefarious practice, secretly or openly, directly or indirectly, and by expelling members, if such there be, who are guilty of this practice.

Our scientific achievements may be ever so great, our art developed to a degree near perfect, our skill well-nigh marvelous, and yet, if we fail to gain the respect and confidence of the public, the good we accomplish will be of little avail. The really great work of the profession lies not in the direction of curing the sick, but in imparting knowledge that will enable people to keep well. But we cannot get the public to listen to us, much less believe us, unless we have their confidence in our ability and honesty. It has been truly said:

> "No life can be pure in its purpose and
> strong in its strife.
> But all life is made purer and stronger
> thereby."

Just as true is it that no life, however "strong in its strife," can accomplish much if it be not "pure in purpose." What is true of the individual is true of a collection of individuals—a community, a profession. It is of paramount importance then that we do not allow the glitter of gold, the glamour of scientific achievement, or the clouds of pessimistic practicalism to blind out eyes to the fact that a healthy idealism is a great power—perhaps the most powerful weapon we have to wage in the war against disease and death.

As the "mark of rank in nature is capacity for pain," so the mark of rank in the medical profession is the capacity for joy in the work.

TRANSACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

Proceedings of the Twenty-sixth Annual Meeting, held at Providence, Rhode Island, September 16, 17 *and* 18, 1913.

The President, MILES F. PORTER, M. D., *in the Chair.*

After the usual addresses of welcome the scientific session opened with the reading of a paper on

THE TREATMENT OF PUERPERAL STREPTOCOCCEMIA WITH INTRAVENOUS INJECTIONS OF MAGNESIUM SULPHATE.[1]

BY

JAMES A. HARRAR, M. D.,
New York.

(With Seven Charts.)

IN a most interesting paper read before this Society in 1910, Dr. R. R. Huggins(1) first proposed the use of magnesium sulphate intravenously in the treatment of puerperal infection. This work of administering magnesium sulphate intravenously was an incident in the study of hyperleukocytosis. It had been suggested to Dr. Huggins by observing the increased lymphocytosis in the spinal fluid after subdural injection of the salt in the treatment of tetanus. No increase of the leukocytosis in sepsis was produced, but the beneficial effect upon the bacteremia was so pronounced that he reported four cases of puerperal streptococcemia in which the intra-venous infusion of magnesium sulphate had brought about an apparent cure. He proved by experiment that in weak solution magnesium sulphatedid not inhibit the growth of the streptococcus *in vitro,* that it did not increase the leukocytes in the blood, and was unable to advance any explanation as to the rational therapeutics of the procedure. He employed a solution of 30 grains of the drug in 8 ounces of normal saline, and verified the work of Meltzer(2) that in weak solution the salt is without danger when used intravenously, if the injection is made very slowly.

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

Impressed with these results and interested in any means of combating the ravages of severe puerperal infection, Dr. R. W. Lobenstine(3) tested the method at the New York Lying-In Hospital with more or less success. He effected a cure in three cases of streptococcic toxemia of the fulminating type, and in one case of streptococcic bacteremia. This case he reported at the time, and I include it in the present series. His fifth and last case, one of streptococcic toxemia, but with negative blood cultures, resulted fatally, and rather discouraged him in the efficacy of the treatment.

In continuation of this work, I have employed the salt intravenously in nine additional cases of the severer type of puerperal infection, the bacteria having been demonstrated in the blood of five. The total series of fourteen cases, with complete recovery in twelve, I therefore venture to present briefly with accompanying fever charts as clinical evidence of the value of this adjunct to our present means of dealing with puerperal infection, especially of streptococcic origin. Let it be emphasized that it is quite necessary not to omit any of the approved details in handling these cases, as I am by no means prepared to say that magnesium sulphate is a specific in their treatment. Careful feeding, absolute rest in the open air and sunshine if possible, and strict avoidance of local or operative interference except with the most evident indication therefor, are principles too well established to be neglected. The open-air solarium on the roof of the Lying-In Hospital is especially devoted to receiving cases of puerperal infection. In the chronic cases we have noted invariably marked improvement after transfer to the roof.

It is always more satisfactory, if possible, in advocating a new or unusual treatment for disease to present some theory of the therapeutic action of the drug employed. It must be confessed at the outset that one is at a loss to propose any such theory for this action of magnesium sulphate. That in a 1 or 2 per cent. solution it is not bactericidal *in vitro* was shown by Dr. Huggins. This has been carefully verified by Dr. J. R. Losee of our hospital laboratory. We also have tried to imitate the action in the blood by introducing a weak solution of magnesium sulphate into the blood culture. Cultures of 3 c.c. of blood from Case XIV were added to 100 c.c. neutral glucose boullion together with magnesium sulphate sufficient to make a 2 per cent. solution. No constant difference in a series of tests could be observed between the growth in the flasks to which the salt had been added and that in the control flasks. A number of hemolytic tests then were made to ascertain the action upon human red blood cells. A 2 per cent. solution of magnesium sulphate in freshly distilled water will not hemolyze human red blood cells suspended in normal saline. Sterile water alone added to the suspended red cells results in considerable hemolysis. This was done to prove or disprove the suggestion that by alteration in surface tension and hemolysis of the red cell certain elements already in the human organism might be freed to combine in the attack against the foreign bacteria. However, it is quite plausible that magnesium sulphate may act by stimulating the tissues to the production of opsonin, and thus aid in the destruction of the bacteria.

There also remains the possiblity of an agglutination of the bacteria in the blood by the presence of the salt. Besson(4) in his recent text-book of bacteriology describes certain chemical substances that have the property of agglutinating microorganisms, and goes on to mention weak solutions of commercial formalin, alcohol, chrysoidin, and bichloride of mercury. In the past we have all been witnesses to the attempts at treating puerperal fever by the intravenous injection of these various chemicals in solution. They all proved to be dangerous poisons to the host as well as to the parasite.

It is rather difficult to test the agglutination of streptococci. In culture they grow together and form large granular masses, so that for agglutination tests a homogenous emulsion must be prepared. The serum of patients while suffering from streptococcic infection has no agglutinating capacity for streptococci. The serum from case XIV, after the bacteria had disappeared from her blood, agglutinated streptococci in dilution of 1 to 600 and 1 to 1200. Besson has proved that Marmorek's anti-streptococcic serum has feeble and irregular agglutinating properties. To a given volume of culture at least one-third of that amount of serum must be added. On the other hand, Aronson's serum possesses considerable agglutinating properties for most streptococci. Some cultures are agglutinated in a dilution of 1 to 20,000.

A homogenous emulsion of streptococci was prepared from an agar culture of Case XIV of the series. Equal parts of this emulsion and a saturated solution of magnesium sulphate produced agglutination after one hour's incubation at 37° C., while a control test produced no agglutination. Weak solutions of magnesium sulphate produced no agglutination *in vitro*. That magnesium sulphate in strong solution acts as an agglutinin on various bacteria has been demonstrated recently by Liefman,(5) who has employed it in various strengths in the differentiation of allied strains of bacteria of the colon-typhoid group by the precipitation of their albumins in contrast with serum precipitation. He proved the superiority of the salts of the lighter metals in these experiments, and selected magnesium sulphate as giving the most delicate reactions. He concludes with the statement, "I believe that one need not despair with simple physical means to secure just as characteristic results as are produced with the sera of immune animals."

It is also well known that successive generations of bacteria gradually become immune to simple chemical poisons. This principle might be said to be exemplified in the clinical behavior of these cases of puerperal bacteremia under magnesium sulphate injections. The drug either cures them in the acute stage or else carries them through into the stage of chronic pyremia where other elements, localization and production of bacteriolysins, or the administration of autogenous vaccines, completes the cure.

Technic of the Injections.—A 2 per cent. solution of chemically pure magnesium sulphate is prepared with freshly distilled water. This is filtered and sterilized in half-liter flasks in an autoclave. This solution will not hemolyze human red blood cells, and I have found by experience that prepared in this way it will not cause any temperature reaction in the patient. Formerly a 1 per cent. solution of magnesium sulphate in physiological salt solution was employed, and a chill or sharp temperature rise frequently followed the injection. A simplified salvarsan apparatus is preferable for the injection but the ordinary infusion set will answer the purpose quite as well. It is important not to cut down upon the vessel, as by direct puncture the same vein can be used a number of times. As many as eight punctures of the same vein have been made on different occasions. The secret in getting into the vein is to make it markedly prominent. This is done by temporarily placing a constricting rubber tube about the upper arm just tightly enough that the faintest pulsation may still be felt in the radial artery. If the constriction about the upper arm is too tight, the arterial as well as the venous circulation will be cut off and the vein will not distend with blood. The needle is inserted in an oblique direction, the spurting of blood from the open end indicating proper entrance into the vein. The rubber tube of the reservoir with the solution flowing in then rapidly slipped over the shoulder of the needle. The reservoir is held at not more than one foot elevation, which will run in 400 c.c. of the solution in about twenty minutes. The injection should be made much slower than the ordinary saline infusion.

The patient experiences a sensation of heat toward the end of the injection, and frequently feels faint, although the pulse usually gains in quality. A small drink of hot whiskey or aromatic spirits of ammonia will steady her. Occasionally the respiration assumes a sighing quality, but no decrease in rate or in depth of the respirations has been observed. It is quite evident that the dangers are not so marked, the drug is not so toxic, when given intravenously, as when employed intraspinously where it is applied directly to the nerve tissue. I have given as much as 400 c.c. of a 2 per cent. solution intravenously simultaneously with 400 c.c. by hypodermoclysis, representing 16 grams or 250 grains of the drug, with no alarming effects. Whereas by intraspinous injection for the production of anesthesia, or in the treatment of tetanus, Meltzer(6) advises 1 c.c. of a 25 per cent. solution per 20 pounds of body weight, or about 25 grains for a 130-pound individual, as the safe limit. The injections should be repeated every second or third day according to the course of the infection as revealed by the temperature chart.

The method has now been employed in fourteen cases at the Lying-In Hospital. In five of these there was a streptococcic bacteriemia as proved by blood culture. The other nine were all severely infected women with high temperatures and acutely ill with streptococcic toxemia, with pure growth of streptoccoci on uterine culture, but with negative blood cultures.

In forty-six cases of puerperal infection with blood cultures showing streptococci, previous to 1910, but three survived, a mortality of 93 per cent. In the five cases with positive blood cultures since 1910, treated with intravenous injections of magnesium sulphate, all but one have recovered, a reduction in the mortality from 93 to 20 per cent. While this is a small series upon which to base percentages, a perusal of the case reports and of the temperature charts will show that they were desperately ill patients, and of the class heretofore doomed to a fatal issue.

REPORT OF CASES.

CASE I.—Mrs. R. S., a para-ii, twenty-five years of age, was admitted April 30, 1911. She had been delivered with instruments ten days previously. On the second day she had a chill followed by fever and some pain in the lower abdomen. For the succeeding eight days the temperature varied between 102° and 103° F. On admission the temperature was 103.4°, the pulse 112, and the respirations 32. Shortly afterward she had a chill lasting twenty minutes and the temperature rose to 106.8° and the pulse to 140. A blood culture was taken and 30 grains of magnesium sulphate in 8 ounces of sterile water were administered intravenously. The following morning the injection of magnesiun sulphate was repeated. The blood culture taken the day before was sterile, but the uterine and cervical cultures showed a pure growth of streptococci. The next day the temperature fell to normal and remained so two days, then rose to 103°, but in two days more, the sixteenth day postpartum, it again reached normal and she was discharged on the twenty-fourth day. Blood culture on the eighteenth day also showed no growth after forty-eight hours incubation. This case is interesting in that after ten days of infection, the fever gradually growing higher to reach 106.8° on the tenth day, two injections of magnesium sulphate caused a rapid fall by lysis and brought the case to a satisfactory termination.

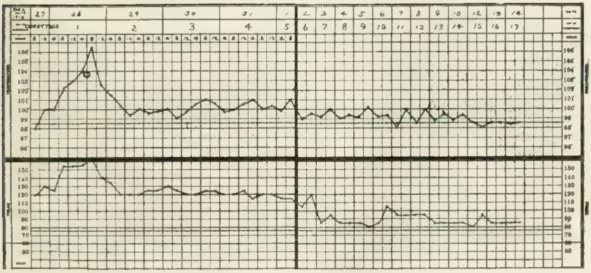
Case II.—Mrs. A. C., a primipara of twenty-six, was admitted December 4, 1910, with a history of having been twenty-four hours in labor. High forceps had been attempted by her private physician. She was delivered of a still born-child with forceps, and given an intrauterine douche. After delivery her temperature was 98° F. and her pulse 90. On the second day her temperature began to go up. An intrauterine culture showed streptococci. The blood culture was negative after seventy-two hours. The temperature was irregular, going to 103.2° F. on the thirteenth day and to 104° F. on the fourteenth day, when a second blood culture still resulted in no growth after forty-eight hours. On the seventeenth day, with the temperature at 101° and the pulse at 90, she was given 30 grains of magnesium sulphate in 8 ounces of water intravenously. In fifteen minutes she had a chill, the temperature going to 104° and the pulse to 130. This was followed by a fall to subnormal. On the twentieth day, with the temperature at 102.3° the injection of magnesium sulphate was repeated. She had a second chill, the temperature going to 105° and falling to 97° in eight hours. The water used in making the solution was not freshly distilled. The temperature then remained normal after the twenty-second day. It is quite probable that the convalescence of this woman was prolonged by repeated intrauterine douchings and iodine applications to the cervix; but the benefit and rapid convalescence after the two intravenous injections of magnesium sulphate are most interesting.

Case III.—Mrs. P., a primipara eighteen years old, was admitted four days after delivery in her home by a midwife. For two days she had been running a high temperature. Her appearance was one of profound sepsis. The temperature was 101° F., the pulse 120. The uterus was moderately firm and fairly well contracted. Both uterine and blood cultures were taken. The blood showed a leukocyte count of 18,000, with 85 per cent. of polynuclears. A gentle digital exploration of the uterus was made, and a small amount of placental tissue removed.

The uterine culture showed a pure growth of streptococci at the end of twenty-four hours. The blood culture presented no apparent growth after twenty-four hours, but a very abundant growth of streptococci at the end of forty-eight hours.

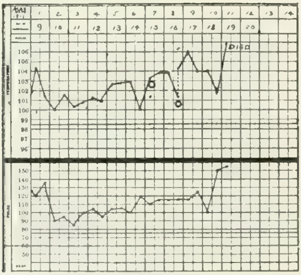
On the second day after admission, as the patient was evidently growing worse, it was decided to try the use of magnesium sulphate intravenously. Accordingly 30 grains of the salt were dissolved in 8 ounces of sterile water and introduced into one median basilic vein. There was a slight chill after the infusion and the temperature went up temporarily from 103° to 104.2° F. The pulse continued at about 120 to the minute. On the second day following this first injection, both pulse and temperature showed some slight improvement. The patient's condition also seemed a trifle better. On the third day after the injection the temperature dropped to nearly normal, while the pulse came down to ninety. That night, however, there was a sudden change for the worse; the temperature rose to 105°, and the pulse to 136. Strong stimulation was required and death was looked for within twenty-four hours, the patient becoming weak and listless. A second injection of magnesium sulphate was now given. This was followed by a chill and temperature rise to 106.4° F.

Within six hours the temperature and the pulse began to subside, so that two days later both were normal. A blood culture at this time remained sterile after three days incubation. Convalescence was uneventful thereafter.



CASE IV.

CASE IV.—S. V., a primipara of nineteen, was admitted to the hospital in December, 1910, suffering with an incomplete septic abortion at the third month. She was very anemic from the large quantity of blood she had lost. The red blood corpuscles numbered 1,220,000 and the hemoglobin was reduced to 25 per cent. The white blood cells numbered 30,000, the polynuclears being 88 per cent. The uterus was emptied with the gentle use of the large blunt curet, and the uterus was packed. The following day, the pulse having risen to 150 and the temperature to 104°, the packing was removed. At 5.30 P. M., she was given 30 grains of magnesium sulphate. Within a half hour, the temperature by rectum had risen to 106°, and the pulse to 160. She was very nervous and excitable. Urination and defecation became incontinent and the patient was rather delirious. The temperature rose to 106.4° in an hour. In two hours it had fallen to 104°, the pulse to 148 and the respiration to 36. By midnight the temperature was 102.6° and the pulse 140, the respirations 28. The patient was very restless the first part of the night with the respirations labored. The latter part of the night she slept at intervals. The next morning she was greatly improved and after the sixth day her temperature became and remained normal. The red blood cells fell to 1,160,000 and the hemoglobin to 20 per cent. The blood picture gradually improved and she was discharged on the seventeenth day.

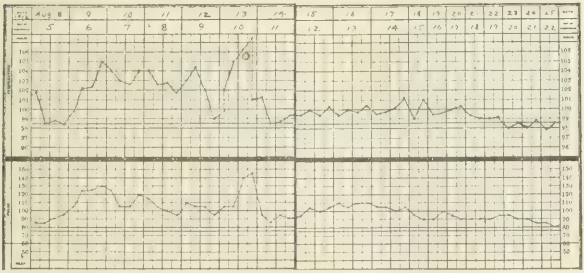


CASE V.

CASE V.—Mrs. S. A. was admitted ten days postpartum in May, 1911. On the fourth day she had had a chill followed by a rise of temperature to 104°, and vomited several times. There was some pain and tenderness in the right inguinal region, which increased until admission. The lochia became foul on the fifth day. There was considerable abdominal distention for three days previous to admission. Blood culture was negative. Uterine cultures showed streptococci in pure growth. There was apparently nothing to be felt on abdominal or vaginal examination. She grew gradually worse until the fifteenth day when 30 grains of magnesium sulphate were instilled into the left median basilic vein. This was repeated on the following day, but without benefit. She died on the nineteenth day, ten days after admission, of a probable peritonitis. This case is noted to show a case of fatal puerperal infection probably of streptococcic origin, but with negative blood findings. Had the magnesium sulphate been employed earlier and a curettage on the fourteenth day postpartum omitted, the case might have terminated differently.

Case VI.—Mrs. A. D. This patient ran an irregular type of temperature. On the fifth day there was a severe chill and a rise of temperature to 106° F. The patient had had a manual extraction of the placenta at the time of delivery in the Out-Patient Department service. Cultures showed a streptococcic infection of the uterus. From the third day there was a foul lochia. The patient seemed to be doing well on the tenth day, but on the twelfth day the temperature rose to 104°. On the fifteenth day 11 ounces of a 1 per cent. solution of magnesium sulphate were given under the breast. The temperature went up to 105° F., and showed some improvement. On the seventeenth day the temperature again rose to 103°, and a second injection of 14 ounces of the solution was given under the breast. The patient promptly improved.

Case VII.—Mrs. P. O. was delivered by a trained midwife on August 3, 1912. The placenta was said to be intact. The following day the temperature was 103° F. The abdomen became distended, and a private physician gave her an intrauterine douche. He repeated the douche daily for three days when she had a severe chill. She was admitted to the hospital on the fifth day postpartum with a temperature of 102° and a pulse of 90. The abdomen was distended and tympanitic and the lochia was foul. She improved under catharsis and expectant treatment for thirty-six hours, when the abdomen again became distended, the temperature rose to 102.2° and the pulse to 124. Under ether anesthesia the uterus was explored and a large amount of what seemed to be placental tissue removed with the large blunt curet.



Case VII.

The following day a blood culture was made. This proved sterile after forty-eight hours' incubation. By the tenth day the temperature had reached 105° and the pulse 140. She had become restless and delirious. The abdomen was distended and resistant in the lower portion. The lochia was abundant and with no odor. At 5 P. M. 300 c.c. of a 1 per cent. solution of magnesium sulphate in sterile water was administered intravenously. Within two hours the patient's temperature went to 107.6° F. This is the highest temperature I have ever witnessed in a septic case without fatal issue. She was given a cold pack and stimulated and the temperature rather rapidly fell to 101°. The following day the temperature had fallen to normal and a big change was noted in the patient's general condition. A second blood culture taken at this time also proved sterile after forty-eight hours. After this the convalescence remained uneventful.

The laboratory report on the tissue removed from the uterus showed it to be made up for the most part of muscle tissue which was infiltrated with leukocytes and serum. There were a few areas where there was distinct abscess formation. No placental tissue was present (another argument against curettage in puerperal infection).

CASE VIII.—Mrs. R. McC. was admitted August 24, 1912, with ruptured membranes and an impacted breech presentation. Her temperature was 102° F., and pulse 126. A breech extraction was done and the uterus packed for postpartum hemorrhage. The fever ranged between 101° and 104° for five weeks. There were several rigors followed by a rise to 106° F. A thrombophlebitis of the pelvic veins, with extension to the saphenous of the right leg, occurred. The course of her illness was further complicated with several infarcts of the lung. She received several injections of magnesium sulphate and finally recovered on the sixty-second day. Blood cultures on six different occasions were sterile after forty-eight hours' incubation. In this case it is questionable if the injections were of any benefit. Her recovery was due to prolonged rest in the open air for two months on the hospital roof, abundant nourishment, and an occasional anodyne for pain.

CASE IX.—Mrs. A. F., a primipara of twenty-seven, was admitted in labor, with the fetus presenting by the shoulder, and with the arm and pulseless cord prolapsed in the vagina. She was delivered by version after some difficulty, and a second degree laceration of the perineum was immediately repaired.

The temperature, which had been 100° F., on admission, rose immediately after delivery to 102.3° and the pulse from 110 to 140. The red blood cells numbered 4,300,000 to the cubic millimeter and the hemoglobin registered 75 per cent. The leukocytes were 33,000, the polynuclears numbering 91 per cent. For the first four days the temperature ranged high, between 103° and 105°. A blood culture taken on the third day showed a pure growth of streptococci in twenty-four hours. She was given 300 c.c. of a 1 per cent. solution of magnesium sulphate in normal saline intravenously at 5 P. M. on the fourth day. At 5.45 she had a severe chill, and became rather irrational. The temperature, which had been 104.3° at 4 P. M. had fallen to 103.3° by 8 P. M., to 101° by midnight, and to 98° at 4 A. M., the lowest since admission. The pulse dropped from 140 to 100. A large decubitus had rapidly formed over the left sacral region, notwithstanding the greatest care.

On the fifth day, she was again given 48 grains of magnesium sulphate in 1 per cent. solution. This was followed by a chill and a rise in temperature to 104.3°.

On the sixth day, the temperature being 103° and the pulse 120, 48 grains of magnesium sulphate were administered intravenously. This was followed by a chill. Eight hours later the temperature was 101°. The patient was irrational and delirious most of the time when not under opiates.

The eighth day a blood culture still gave a pure growth of streptococci after twenty-four hours incubation. The temperature was running between 101° and 99.2°.

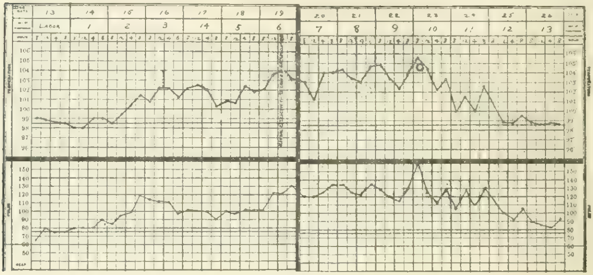
The ninth day, with the temperature at 102°, 96 grains of magnesium sulphate were given at 7 P. M. She had a chill at 8 P. M. and her temperature rose to 103° and her pulse to 150. In eight hours she was resting quietly with the temperature at 98.2° and the pulse at 80. Blood examination on the twelfth day showed the red cells to have fallen to 2,760,000. The hemoglobin registered 58 per cent. The leukocytes were 10,400 and the polynuclears 78 per cent.

On the fourteenth day the blood culture was sterile after twenty-four hours but showed a growth of streptococci after forty-eight hours. For the next ten days the temperature ranged between 100° and 102°. Her mentality cleared up, and she was much improved in every way. On the twenty-sixth day a blood culture remained sterile after twenty-four and after forty-eight hours' incubation. From the twenty-sixth to the thirty-sixth day the temperature was between 99° and 100°. After the thirty-sixth day she ran a practically normal temperature and was discharged cured on the fiftieth day postpartum.

All during her convalescence she complained bitterly of pain in the left sacroiliac joint. This was unrelieved by strapping, or by heat or cold. On vaginal examination there was swelling and tenderness along the line of the joint, but no fluctuation was ever present, nor were there any masses higher up in the pelvis. The anemia rapidly improved under free diet, open-air life on the roof solarium, and small doses of iron citrate. She returned several months later for a secondary repair of her perineum, still complaining of some pain in her left sacroiliac joint.

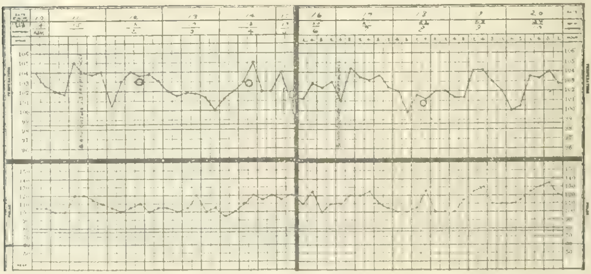
Case X.—F. C., a primipara of twenty-six, had a normal labor at term, December 13, 1912. On the second day the temperature began to rise and on the following day she had a sharp chill lasting fifteen minutes. The temperature continued high, reaching 104° F. on the sixth day when she had a profuse hemorrhage. Under anesthesia a mass of tissue was removed from the uterus resembling a sloughing fibroid. Microscopic examination showed it to consist of thickened decidua and organized blood clot. The uterus was packed with iodoform gauze which was removed two days later. The temperature continued high, with the pulse ranging between 130 and 140. On the morning of the tenth day the temperature had reached 105.4° and the pulse was running and almost imperceptible. She appeared to be dying. 400 c.c. of a 2 per cent.

solution of magnesium sulphate were administered intravenously. The effect was startling. Within a few hours the pulse had fallen to 120 and was strong, and the temperature had fallen to 102°. Two days later the temperature reached normal and remained there.



Case X.

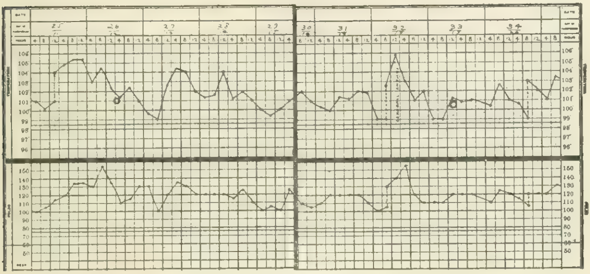
Case XI.—G. C. This woman had been confined fourteen days previous to admission in a miserable place by a midwife. She was pale, weak, ill nourished and very dirty. The skin was dry and pasty. The tongue was dry and the teeth covered with sordes. The lips dry and scaly and she looked apprehensive and pinched. The temperature was 104°, the pulse 110, and the respirations 28.



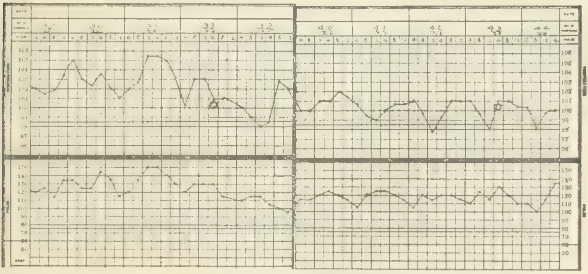
Case XI. Part 1.

There was some tenderness over the uterus, which was 15 cm. above the pubes, but otherwise the abdominal and vaginal examination was negative. A blood culture showed the presence of streptococci in large numbers at the end of twenty-four hours. The next day, 350 c.c. of a 1 per cent. solution of magnesium sulphate in freshly distilled water was introduced into the vein of the right arm. There was no reaction during or immediately after the injection. The same night 10 c.c. of a stock antistreptococcic serum were given in the muscle of the buttock.

The following day she was much improved and was put out upon the roof of the solarium where she spent the remainder of her convalescence. Two days later 350 c.c. of a 2 per cent. solution of magnesium sulphate in freshly distilled water was given intravenously. She improved for several days when a second blood culture was sterile after twenty-four hours, but showed a growth of streptococci after forty-eight hours. She seemed distinctly better, however, and the house surgeon made a note, "Nothing to go by save the pulse and temperature." However, that night he had something to "go by." The patient suffered a chill and became unable to talk. The right side of the face was paralyzed and she became spastic in the left arm and leg. The condition was suggestive of a septic embolus lodged in the pons. The following day she was again given magnesium sulphate. The aphasia cleared up in a

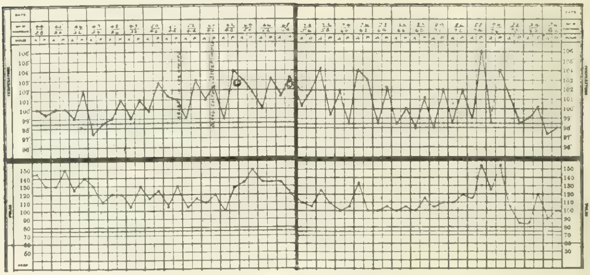


CASE XI. PART 2.

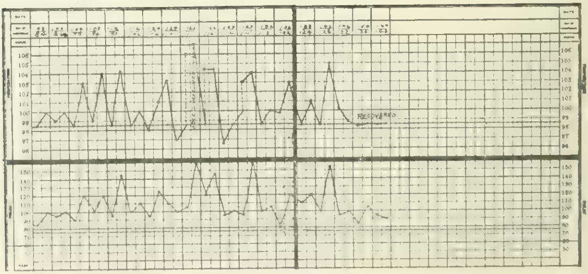


CASE XI. PART 3.

couple of days, and on the third day after the paralysis, thirty-three days postpartum, a blood culture was sterile after forty-eight hours' incubation. Two more injections of magnesium sulphate were given at four-day intervals. Then a phlebitis developed in the left leg on the forty-third day. This broke down after a fortnight and a quantity of pus was evacuated by an incision. Blood cultures again showed streptococci, and the magnesium sulphate treatment was resumed on the sixty-four day. Autogenous vaccines were tried for ten days but without benefit. Infarction in the lung was the next complication on the 125th day postpartum, and abscess of the lung supervened, breaking down a week later with the expectoration of a large quantity of pus containing streptococci. After this she rapidly improved and went home cured and rapidly regaining her strength on the 157th day. The paralysis of the leg and arm had practically disappeared. This was one of the severest cases of the series. The infection was a hemolytic streptococcus. She seemed to be progressing splendidly until the



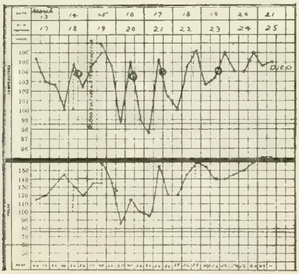
CASE XI. PART 4.



CASE XI. PART 5.

chronic pyemia started. The localization of the infection in the various abscesses, however, eventually proved her cure.

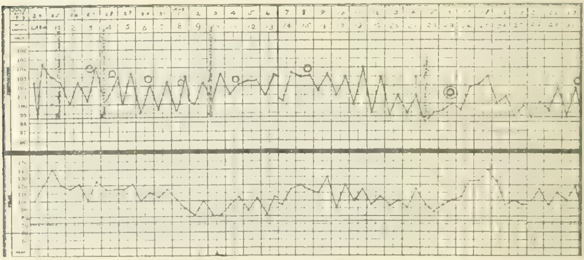
Case XII.—Mrs. R. G. was admitted on the fourth day post-partum with a temperature of 101° F. and a pulse of 120. The fundus was high and tender and the abdomen was distended. A blood culture was taken which proved sterile after forty-eight hours. On the fifth day after admission she had three chills, the temperature ranging between 104° and 105.4°; 350 c.c. of a 2 per cent. solution of magnesium sulphate were administered at 5 P. M. with the temperature at 105.4° and the pulse at 150. At 8 P. M., the temperature had fallen to 102°, the pulse to 120. By midnight the temperature was 100°, the pulse 110, and at 4 A. M. the temperature was 99°, the pulse 100. She improved after the injection for thirty-six hours when a septic pneumonia developed. The respirations ranged from 36 to 48 until the seventeenth day. On the twelfth day post-partum a second injection of magnesium sulphate was made at 4 P. M. The temperature fell from 103.2° to 99 in eight hours, the respirations from 36 to 28. The temperature ran an irregular course until the twenty-fifth day. She was discharged on the thirty-fifth day post-partum.



Case XIII.

Case XIII.—Mrs. A. R., a primipara, was admitted in desperate condition on the seventeenth day postpartum, suffering with thrombophlebitic bacteremia. She had done very well until the ninth day, when on being lifted out of bed, she fainted and became feverish. She said her right leg was a little painful that day. A few days later the leg became tender, and she began to have chills and fever. She was admitted with a temperature of 105.3°, pulse of 120, and respirations 40. The lungs were congested at the bases posteriorly. The abdomen was distended and tympanitic. There was no rigidity or tenderness. No masses could be palpated. There was marked edema of the right leg and thigh, and redness along the upper course of the internal saphenous vein. Blood culture showed the streptococcus hemolyticus. She was given two injections of magnesium sulphate on the eighteenth and twentieth days, and seemed to be somewhat improved. On the twenty-first day, a panophthalmitis of the left eye began with pus in the anterior chamber. After this she grew rapidly worse and died on the twenty-fifth day, eight days after admission. This is the one fatality I have to record among the cases of puerperal infection I have treated with magnesium sulphate, but she came to us late, developing no resistance to her infection.

Case XIV.—Mrs. DeG., a para-ii of twenty-five, was admitted in labor in July, 1913. The membranes were unruptured. She was jaundiced, her tongue was badly coated, and her breath was foul. There were many sonorous and sibilant râles over the chest. The abdomen was distended and slightly tender. The spleen was not palpable. A tentative diagnosis of typhoid was made, which was later refuted by the negative Widal and the course of the illness. The temperature on admission was 102.2°, pulse 100 and respirations 32. In a few hours she was spontaneously delivered of a dead fetus.



Case XIV.

The temperature continued high, 104.2° F, and the pulse 140. A blood culture was made that showed a growth of the streptococcus hemolyticus at the end of twenty-four hours. On the third day, she was given 400 c.c. of a 2 per cent. solution of magnesium sulphate in freshly distilled water. This was repeated on the fourth and sixth days. A second blood culture on the fourth day showed a growth of the hemolytic streptococcus. The patient felt much better and wanted to get up. On the seventh, eighth and ninth days she was repeatedly found sitting up in bed against advice. The mental condition was clear from the first. On the eighth day a thrombosis of the right external saphenous developed which was exceedingly painful. She was again given 400 c.c. of magnesium sulphate intravenously. A blood culture on the tenth day still showed the presence of streptococci. On the eleventh and fifteenth days she received similar intravenous injections of magnesium sulphate, after which the temperature and pulse showed a distinct downward tendency, reaching normal on the twenty-second day.

A blood culture taken at this time, however, showed streptococci, and on the twenty-third day she was given 256 grains of magnesium sulphate in a 2 per cent. solution, half into the vein and half under the right breast simultaneously. She showed no ill effects whatsoever from this amount of the salt. A pleurisy now developed near the left apex anteriorly. This caused some secondary temperature reaction. The temperature was practically normal from the thirty-first to the thirty-fourth day, although the blood still contained hemolytic streptococci. She received a final intravenous injection of 400 c.c. of the 2 per cent. solution on the thirty-seventh day. On the fortieth day, a blood culture remained sterile after forty-eight hours, and the remaining convalescence was uneventful.

CONCLUSIONS.

1. In the quantities and dilutions described, magnesium sulphate is absolutely harmless when administered intravenously to women suffering with puerperal infection.

2. Magnesium sulphate is of more value early in the course of the infection than after secondary localization has occurred. In the chronic cases of secondary thrombophlebitis or pyemia it does not appear to be of benefit. Its action seems to be chiefly upon the organisms circulating in the blood.

3. It shortens the course of the bacterial toxemias in which the bacteria cannot be demonstrated in the blood by culture, and anticipates the establishment of a bacteriemia, and finally,

4. It has reduced our mortality in puerperal bacteriemia, especially in streptococcemia, the most fatal form of puerperal infection, from 93 per cent. to 20 per cent.

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29 EAST SEVENTY-SEVENTH STREET.

DISCUSSION.

DR. ROSS MCPHERSON, New York City.—I have had very little experience with the actual treatment that Dr. Harrar has described except in watching his results. Only one case has come under my observation, which was not a true bacteremia, and that case did very well.

The results, as Dr. Harrar describes them, are nothing short of marvelous as you see these patients improve, and it seems as if we had in magnesium sulphate something which is distinctly worth while to try out pretty generally. The cases of sepsis, without blood culture, are always open to a certain amount of discussion as to whether they would not have done very well under ordinary treatment. The bacteremia cases are very nearly always fatal, and anything which will produce even in five cases, the results Dr. Harrar has given us, is little less than miraculous.

Dr. Asa B. Davis, New York City.—I wish to confirm what Dr. Harrar has said. In the large number of cases of puerperal sepsis treated in the Lying-in Hospital, there have been comparatively few cases of true bacteremia and yet fewer in whom the blood cultures show streptococci. Dr. Harrar has interested himself in this line of investigation and for this reason we have turned over to his care all such cases, thinking it better to concentrate this treatment in his hands where it can be thoroughly tried out. I have watched with interest and gratification the work which he has done in the cases which have come into my service.

Dr. Herman E. Hayd, Buffalo.—While I have had no experience with magnesium sulphate, I want to say that such a record as Dr. Harrar has given us ought to stimulate all men in this association to try this treatment, and next year, or at some future meeting, we can relate our experiences in regard to this new form of treatment. It strikes me as being not only very practical but reasonable for us to try in hospitals because there is no expense connected with it. All the vaccines we have been using in these cases are so expensive that it becomes a burden to the institutions to carry on a line of experimentation which we have heretofore been compelled to employ.

Dr. Gordon K. Dickinson, Jersey City.—This paper is more than an obstetric one. It may be of immense value in the bacteremias of the other diseases. I myself am an anaphylactic to the pneumococcus germ, and have wondered whether the doctor in his study of the use of sulphate of magnesium in streptococcemia has not allowed his mind to wander in the other paths, to pneumonia and the infections from other germs. We are all interested in other types of bacteremia, and if he can give us some points on the matter of pneumococcemia and the coccemias of other germs, it might instigate experimentation in different lines.

Dr. Budd Van Sweringen, Fort Wayne.—I was very much interested in the paper of Dr. Harrar and the recital of the case in which a good deal of time elapsed between the beginning of the infection and the close of it. The recovery, as I understand, was attributed not only to the employment of magnesium sulphate solution, but to the establishment of an abscess in the lung. In the words of Dr. Harrar, this seemed to accomplish the cure.

I have no notes of several instances of streptococcic infection that have come under my observation that are available at this time, but I have had a personal experience that I would like to call attention to that may have some bearing. If it be true that the establishment of an abscess in the lung, as in this one case the Dr.

recites, was responsible for the cure brought about, it bears out the contention of a man by the name of Fouchier, who wrote upon the establishment of abscess in these conditions by the injection of turpentine into the tissue of the thigh or back or any available place. I imagine the good results reported by him at that time were due to a biological process, perhaps the establishment of antibodies in this "fixation abscess" as he called it, and whatever the theory may be, a number of cases of my own were treated in that way, as well as others I have knowledge of, and were followed by improvement.

I have had no experience with the injection of magnesium sulphate whatever, but I would like to know whether any of the Fellows have employed this fixation abscess in streptococcic infections, and what experience they have had with it.

Dr. Roland E. Skeel, Cleveland.—I merely want to ask a question and to make a suggestion. I feel that the impressions are worth more than the statistics of the author of this paper, because we can think up any old sort of statistics and prove anything by them that we choose.

It has been very common in recent years for men to make preliminary reports of this kind, and not give us the statistics after the first year, yet this is necessary in order to follow up the use and demonstrate the value of magnesium sulphate in the class of cases described. It is of vast importance to know that twelve or thirteen out of fifteen cases of true streptococcic blood infection, have really responded to this treatment and have recovered after its use. That statement is startling and tremendously vital and it might apply not only to puerperal septicemia, but perhaps to other infections. I would ask the gentlemen who started this work to keep it up, and if it should fall flat, report that flat failure in two or three years from now as methodically as they have reported their preliminary work. This is one of the things in which we fail. We report our wonderful successes, but we do not report our wonderful failures, and I think these observations and investigations should be followed up until it is proven or disproven that sulphate of magnesium does what is claimed for it. In the past we have failed to follow observations of this kind to the end, and I hope that Dr. Harrar will give us a report in three years or even five years from now, since by so doing we will know positively whether there is really anything in it or not.

Dr. Joseph H. Branham, Baltimore.—It seems to me, it would be very much better if the Fellows of this association as a whole would undertake to carry on further experimentation along this line. If this were done, in one year we could demonstrate the value of magnesium sulphate in these cases of infection, and we would not have to wait four or five years. If all of us had cases of this kind, and we have plenty of them in surgery of one kind or another, and made observations concerning the use of this remedy, we would have reliable data as a guide for this treatment in puerperal sepsis. If we would carry out this method of treatment, in one year this Society could absolutely demonstrate beyond a doubt what there is in this treatment.

Dr. H. Wellington Yates, Detroit.—I have been very much interested in this paper, as I was in the paper which Dr. Huggins presented at the Syracuse meeting of this association. I thought there was a general impression at the time that Dr. Huggins in his paper was somewhat biased in his impressions, and that may obtain even now; but we must agree on the laboratory report and with the unbiased writings of Dr. Harrar, that it is becoming more substantial than apparently was the case when Dr. Huggins presented his original paper. Therefore, with the other gentlemen I would suggest that either separately or conjointly as a society we attempt to follow this matter up.

I was impressed with the presentation of the subject, inasmuch as Dr. Harrar apparently regards the toxicity of magnesium sulphate as of very little or no importance. I may be mistaken about this, but in the report of his cases I find that in each instance in which the magnesium sulphate was injected, there followed a distinct chill, with rise in temperature, in most every case, in some to a remarkable degree and, therefore, I think the use of magnesium sulphate is not always so innocent and it should be used with great care. The severity of all these cases inclines me to say this, that as a teaching body of men it behooves us to instruct, as much as possible, the general practitioner who first comes in contact with these cases to have them all in a hospital. Such cases as these cannot under any possible conditions be treated in a private home, and the sooner they are recognized by bacteriological examination and by careful observation the better, and the sooner this treatment is instituted the better.

I was interested again in observing the marked hemolysis in these cases. In one instance the reds were down to 2,000,000 and the increase was very rapid as soon as the magnesium sulphate was used. I do not suppose it was the magnesium sulphate that increased the red blood cells, but nature did that while the magnesium sulphate was doing the rest.

Dr. Roland E. Skeel, Cleveland.—Owing to the improvement in the technic of making blood cultures in the last two or three years, may not Dr. Harrar have been able to recognize some cases as being true bacteremia that were not supposed to be such a few years ago because streptococci were not obtained by the methods then employed?

Dr. Douglas C. Moriarta, Saratoga Springs.—It seems an opportune time to emphasize the point made by the other speakers, and the one that I attempted to bring out a year ago in a paper before the Society; that is, to determine the value of new thoughts and procedures presented to this society, and this can only be done if we follow them up. If this is done, the information will be valuable to the general practitioner, and we will not be obliged to have the present preface to our column of proceedings "The Association does not hold itself responsible for the views enunciated in the papers and discussions published in this volume."

Dr. Edward J. Ill, Newark.—May I offer one suggestion with regard to our future experience with this very vital subject. The matter that has been presented to us is as good and vital as anything that has been brought before the association, and I am glad to say that a number of things have been brought before this body and originated in this association during the 25 years of its existence which have continued to live. I want to suggest that anyone who attempts to carry on these experiments should not attempt to make a so-called improvement on the method or suggestion of Dr. Harrar; but wait until his paper is published, study it carefully, and then carry out the method he has given us. Do not let us think we can improve on it. That is where we make a mistake in regard to a new method. I have been disappointed in having improvements made on what I have suggested, and the result has usually been a failure, and the method discredited. Speaking for myself, when Dr. Harrar's paper is published, I shall study it carefully, follow the plan he suggests, and if this is done by all of us in a year or two years we can report, and if he wishes us to make a combined report, he will know exactly what we have learned.

DR. E. GUSTAV ZINKE, Cincinnati.—This subject challenges the interest of every Fellow of the society. I have been much interested in it ever since Dr. Huggins read his first paper on this subject. It is a new method and has, apparently, been practised with success. It is our duty to take it up and see what there is in it. The suggestions made by Dr. Skeel are very timely.

Just a few words in regard to Dr. Moriarta's criticism as to the note "The Association does not hold itself responsible for the views enunciated in the papers and discussions in this volume." I merely wish to state if we withdrew this note we endorse everything that has been said and published in the volume and thus hold ourselves, *eo ipso*, responsible for its contents. The fact is we do not endorse all the views and acts expressed at our meetings. We consider and test what appears to us reasonable and good. We criticise adversely and even reject what appears untenable. If anybody resorts to practices recommended by one or several of our fellows and meets with failure or, perhaps, disastrous results, we render ourselves liable to a certain extent at least. We cannot afford to do this.

DR. HARRAR (closing).—I am more than complimented by the extent of this discussion. We started this work at the Lying-In after Dr. Huggin's paper, and used magnesium sulphate rather as a forlorn hope in these desperate cases. We were surprised and pleased to find in the first few cases that it was of real value. My colleagues at the hospital have at times scoffed at the method because it is so simple and easy, and because it has been impossible to give an explanation of how or why it acts. All we do know is, it does act in the manner in which I have described in the cases reported, and that it is entirely harmless used in the manner directed. The sharp temperature reactions, which one of the speakers noticed as having occurred after injection, were in cases in which a 1 per cent. solution in normal saline, or in boiled tap water, was employed.

These reactions were not due to the magnesium sulphate. Since using a 2 per cent. solution in *freshly distilled* water we get no reaction. Similarly in salvarsan injections, it has been observed that it is most important to employ freshly distilled water.

As to the occurrence of true bacteremia, we have a large service at the Lying-in Hospital, over 5000 deliveries a year, and we do not get many real bacteremias. For instance, at the time of the forty-six bacteremias which I mentioned, which occurred in the four or five years prior to 1910, 175 cases were diagnosed clinically as bacteremia, and a blood culture asked for, but only forty-six gave positive results. True bacteremia is not so frequent as many believe. I always feel in reports of large series of positive cultures, that there is some contamination in the technic.

As to the use of magnesium sulphate in other infections, I have had no experience except in one case of pneumonia, evidently a pneumococcus infection. With her it was of no value. Infarcts in the lung with small areas of septic pneumonia are rather common in the thrombophlebitic cases. In five of the cases reported we had a septic pneumonia originating from a septic embolus in the lung. It is not necessarily a serious complication.

I do not feel prepared to make any final statement as to the exact value of this method, because I have not yet seen enough cases. We are continually waiting for some midwife or poorly instructed physician to send in a bad septic case in which we can demonstrate bacteria in the blood. We have only had eight since 1910, in five of which I had the opportunity to employ magnesium sulphate.

It is simple to use, and well worthy of trial. Merely make a 2 per cent. solution in freshly distilled water, sterilize it in an autoclave, and run it into the vein very slowly.

DR. HAYD.—How do you distill your water?

DR. HARRAR.—I do not know the make of our still. The bacteriologist attends to that. We buy distilled water, and re-distill it just before using if for injections.

LACTATION ATROPHY OF THE UTERUS.[1]

BY

DOUGLAS H. STEWART, M. D.,

New York.

HISTORY abbreviated from notes taken by Dr. Stafford B. Smith.

Patient, a physician's wife; aged twenty-five. Married in 1906. Health good at that time. First conception July, 1909. Hyperemesis and renal symptoms of severe toxemia set in almost immediately. Patient became so enfeebled that (September) the womb was emptied. Curettage was followed by uneventful recovery. Second conception January, 1910. With careful nursing and assiduous treatment, patient went through pregnancy safely. Male child born October, 1910. Difficult labor, high forceps, no lacerations. Nursed baby three and one-half months. Then discontinued, on account of poor quality of milk. Mother in a highly nervous state due to husband's departure for Europe.

Normal menstruation (March) five months after parturition. Milk never left breasts so far as is known after this.

Third pregnancy July, 1911. Severe toxemia, prostration and fainting spells. Curetted in August, 1911. Usual flow for two weeks; then gushes of blood nearly every day. Patient complained of a lump in her side, which varied in size and could be felt through abdominal wall. This was verified, a suspicion of extrauterine pregnancy negatived, and the uterus tamponed, all under anesthesia in October, 1911. Good recovery and normal menstruation followed in October, November and December, but in January, 1912, there was only a slight, brownish, bloody stain on a single napkin. After that nothing. Patient complains of dull, dragging ache in left pelvis. She became bloated, discontented and melancholic. During the summer of 1912 she showed all the usual symptoms of the menopause, including a gain in weight of 25 pounds, mostly soft fat. Lying in bed upon her right side would relieve the pain, and standing, sitting upright or lying upon the left side, would intensify it. All treatment proved futile so far as relief was concerned.

January, 1913. Patient came to the conclusion that she could not "Stay in bed forever and standing up was impossible, therefore, the lump must be removed."

February 20. Laparotomy. (Described elsewhere.)

February 23. Normal menstruation lasted three days. February 26, usual brown, pink, fourth day, discharge. Breasts empty for the first time in two years. Unwell monthly ever since. So much for the history.

Treatment, galvanism, faradism, intrauterine stems, and all the expedients that three or four physicians could suggest are not mentioned in detail because, as Dr. Smith stated in the history, "treatment of all sorts failed."

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

Uterine atrophy is the rule in the third or fifth month of lactation, after which time the uterus should enlarge and the menstrual flow should reappear. If this does not so occur, in fairly regular sequence, then the walls of the uterus atrophy, or rather, remain atrophied and the cervix and fundus take part in the atrophy a few months or years later.

The uterine canal in this case was 4 inches in depth, quite a different thing from nondevelopment or infantilism and from senile changes. Repeated examinations revealed a left lateroflexion, traceable from the fundus to the cervix which were often on the same level. The fundus would slide away from the examining finger, presenting the deceptive sensation to the feel of a nonuterine or separate mass. The fundus and cervix were hard, but the thin, stretched body between them could not be made out unless the patient was under deep anesthesia. Traction or pressure upon the cervix did not noticeably move the fundus. The fundus could be placed in any position but always flopped back to the left lateral one.

The passage of the sound necessitated bending it into a large hook, but ill adapted to the vagina, yet it could be passed. Prolapse was not a factor, the flexion was due to lack of sufficient mural rigidity to hold the uterus upright, and when the uterus bent over the ovary prolapsed. Dr. Clement C. Young, who assisted me at the operation, summed up the condition of affairs by stating "This is about as normal a pelvis as I ever saw opened."

Silk was used. The ovary was fastened on its shelf. The uterus was suspended by the round ligaments. The ligature was doubled to prevent cutting, passed through the abdominal wall, and tied outside of the aponeurosis. The points of contact between the round ligament and the parietal peritoneum were touched with tincture of iodine. The abdomen was closed in the usual manner and the results are satisfactory to all parties concerned.

Two months after operation the patient came to me with a very severe pain "way down inside." Examination revealed every structure in good position. Rectal and vaginal palpation showed the inside of tuberosity of ischium (left) to be very sensitive indeed, yet pressure on the bone through perineum did not reveal any tenderness. It was a very confusing thing and only after long study it dawned on me that it must be a neuritis, that it must be gouty (or rheumatic), and that the internal pudic nerve was the offender. Gout is a protean disease, but I am not aware that attacks in this particular region have been described. Charcot found gout occurring on the paralyzed sides of hemiplegics, who, before being paralyzed, were free from gout, and he considered diminished circulation the factor. One would naturally suppose that a lateral horseshoe flexure of the uterus would spoil the venous drainage of that side of the pelvis, determine where the outbreak would occur, and shift it from its usual articular site.

Diet and colchicum acted, as anticipated, and the patient is now in splendid condition.

August 29. Patient reports "good health, camping out and roughing it."

I wish to deny that nursing and curettage are necessary and essential factors. They may or may not be. If the essential cause is ever found, I think it will be discovered in the deficiency of some substance which, when present, causes the usual growth of the uterus, after the usual atrophy which follows the establishment of lactation.

Since writing the above I have studied the following cases:

No. 2. I reported to the *Med. Record* some years ago as giving milk eight years after the birth of her only child. I reexamined her August 5, 1913. Uterine atrophy marked. Tallow-candle shaped uterus. Anteversion: Depth 3 1/2 inches. Nursed child seven months. Curetted once two years after labor. Normal adnexa.

Nos. 3, 4 and 5. Cases consulting Dr. C. C. Young at Bellevue, O. P. D. All one-child sterility. Atrophy well marked. All nursed the child less than one year. No curettage. Lactation. Normal tubes.

No. 6. Case from Newark, N. J. Deep cervical laceration. No curettage. Nursed child four months. Lactation free. One child three years and six months old. Uterine atrophy. Thick tubes.

No. 7. On August 29, I found this woman in Dr. Young's clinic. She was nursing her first child, now eight months old, and she was wondering why her "unwell did not come on." If it ever does reappear I shall be astounded. The uterus is long but barely as large around as one's forefinger. It was hardly creditable that it ever had or could have conceived and borne a child. But it had. No curettage. Anteversion. Normal adnexa.

Theoretically, I am led to think that with lactation atrophy the breasts either produce too much "mammary extract" and the uterus wastes away as a fibroid sometimes will when powdered cows udder is administered; or the secretion drains off, in the milk, some hormone which should stimulate the circulation, nutrition and growth of the uterus after the normal or physiological atrophy of the fifth month of lactation and the physiological process becomes pathological, in time.

In Case No. 1, I made the circulation right. After that lactation ceased and growth and menstruation started at once.

128 West Eighty-sixth Street.

DISCUSSION.

Dr. Ross McPherson, New York City.—Mr. President: I had the pleasure of seeing this case in consultation with Dr. Stewart, and at the time I examined her, which was after Dr. Stewart and treated her for some time, the impression I got from the examination was that the patient had a prolapsed ovary or an inflamed tube with consequent obstruction to circulation, and that was all. The flexion described, at the time I saw her had evidently been corrected, and I recommended that the abdomen be opened, the condition of the adnexa investigated, and treated as seemed best at the time of the operation. As Dr. Stewart has stated, when the abdomen was opened, the pelvic cavity and its contents were nearly normal, as much so as one could desire, with the exception of the prolapsed left ovary. That, as he has told you, was put back into place, and the patient immediately recovered from her trouble. I have wondered since whether the secretion which was present in her breast was not the secretion that we find in many cases of pelvic disturbance, the disturbance being relieved, and the secretion disappearing. I have wondered whether it was not that rather than that the milk had remained for a considerable period of time since the birth of the last child.

The condition is an interesting one, and I think rather unusual. I had not before seen a case of lactation atrophy or one that presented such symptoms. I was glad to see the case, and I hope someone else has seen patients of the same sort.

Dr. David Hadden, Oakland, California.—I think it might be interesting in this connection to report a case I operated on about two years ago. There was no lactation connected with the menstruation. The woman had a baby four years before the time I saw her and had not menstruated. The uterus was retroverted, and both ovaries were prolapsed. There was a deep laceration of the cervix and an ulcer. We corrected these conditions, and two months after operation she began to menstruate and has since menstruated every month, with practically a normal flow.

Dr. Hugo O. Pantzer, Indianapolis.—The paucity of the literature on this subject first came to my recognition some twenty-five years ago. I had confined a frail blonde, who had conceived only after being married upward of a year, and had carried her child to full term. The delivery was by forceps, owing to uterine inertia. There were no complications in childbed. The child was nursed at the breast for two years and thrived wonderfully, in contrast with the mother, who waned in health. Three years after childbirth, the woman had neither menstruated nor conceived again. The desire for more offspring brought her to me. I found a small, atrophic uterus. General roborant remedies, ergot, iron and aloin, and an intrauterine stem worn for several months, reestablished menstruation, and patient conceived again some time later. It seems fair to here associate etiologically the atrophy of the uterus and the amenorrhea with the excessive lactation.

Dr. Stewart (closing).—Dr. McPherson did see the patient as he says. He did more, he removed a Ferguson intrauterine supporter from the uterus at the time of operation, saving me the necessity of introducing my hand into the vagina. But the removal of the Ferguson left the womb in the position of anteversion which was quite different from its usual place.

Atrophy of the uterus presents these paradoxes. It may be puerperal or nonpuerperal; may follow total removal of virgin breasts or too long lactation. It may or may not depend on some alliance with thyroid activity and it may or may not follow birth traumatisms. Lactation-atrophy appears to be a continuance of involution, hence its old name of superinvolution, caused by prolonged lactation even though the period of actual suckling may be short. The atrophy is mural (not at first general or symmetrical) and the depth of the uterine canal is increased; producing a sausage-shaped uterus.

The question "Are pelvic or breast conditions most at fault?" might be answered quite differently with different patients or even with the same patient at different times. Prolonged lactation has a decided tendency to initiate certain evil effects but no amount of pelvic injury can initiate lactation; the injury can disturb after initiation; that is all.

Any injury or condition which disturbs the circulation of blood through the uterus may prolong lactation and thus form a vicious circle, which may be broken most readily by attacking the pelvis first. But in one of my cases the pelvis is in good condition and I would be at a loss to know just what to attack, even though in accord with the opinions expressed that bad pelvic conditions should be remedied as quickly as possible, when existent.

RUPTURE OF THE SYMPHYSIS PUBIS IN LABOR.[1]

BY
HENRY ENOS TULEY, M. D.,
Louisville, Ky.

THE extreme rarity of this accident is justification for the report of the case which follows. Careful research shows that there is but one case in from 30,000 to 60,000 births, including both spontaneous and traumatic varieties.

While recent writers state that there are about 150 recorded cases in literature, these figures cannot be verified, and Kayser's estimate of about 130 cases, *plus* those since recorded, would indicate that the more correct estimate is about 140. It may be safer to state that the estimate varies from 140 to 150.

It has long been the teaching(1) that the articulations of the pelvis become softened and relaxed during gestation on account of the secretion from the synovial membrane lining their surfaces.

The extent to which this softening occurs is not stated by the authors who refer to this phenomenon. I do not think that it is so great as to cause difficulty in standing or walking in very many cases, at least such a condition has never been brought to my attention.

The percentage of cases of rupture which are caused spontaneously varies much according to different authors. Bar, the celebrated French obstetrician, considered forceps delivery, in certain conditions, responsible for most cases, but other authors are equally emphatic that the forceps has nothing to do with causing the fracture. Rudaux gives twenty-seven out of a total of ninety-eight cases as due to spontaneous rupture, which, if accepted, will show that only about 27 per cent. of all reported cases are spontaneous. In support of the fact that spontaneous rupture may occur, Boisliniere relates a case of eclampsia in which spontaneous rupture of the symphysis is reported to have taken place suddenly during an attack of eclampsia in a primipara of twenty years. In this case a crack was heard and the child was easily delivered by forceps.

Ahlfeld(2) records a case in which the pelvic articulations ruptured during labor, although the fetus was expelled within an unruptured bag of membranes—a fact which showed that the intra-uterine pressure could not have been excessive.

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

In the majority of instances rupture of the symphysis is due to excessive or misdirected traction in forceps delivery. Of twenty-three cases of rupture of the symphysis collected by Havaje-Weiz (3) forceps had been used in eighteen. A rupture may occur in an attempt to deliver by forceps an unusually large head; or a normal-sized head through a contracted pelvis, or a head in a persistent occipito-posterior position. It may occur also with forceps applied to the head at the brim and forcible traction made in a direction anterior to the pelvic axis. Lusk(4) states that in a rupture of the symphysis no increase in the capacity of the pelvis is possible without simultaneous rupture of at least one of the sacroiliac synchondroses. At the symphysis the rupture is apt to be complete, at the synchondroses the rupture is usually confined to the anterior surface. It may take place in the median line, or upon the side, between the cartilage and the pubic bone. If the injury be slight, the synovial cavity of the symphysis may not be injured. At the synchondroses, opening of the joint cavity is inevitable. An excessive degree of the lesion is accompanied by laceration of the vagina, the bladder, and the intervening connective tissue.

The accident may be recognized at the time of its occurrence by feeling the bones give way, by hearing the bones snap as in the case of eclampsia referred to above, or it may not be detected until the patient complains of pain on moving, flexion or abduction of thighs or attempting to sit up or walk.

Complications may occur in the form of rupture of the anterior vaginal wall, rupture of the bladder, severe hemorrhages from rupture of the veins about the vestibule, or suppuration of the joint or soft parts.

The following is a brief report of the case occurring under my observation:

Case I.—Mrs. S., aged twenty-three, para-ii, the first child being born in New York City in 1910, forceps delivery. She was seen at 9.30 A. M. November 19, 1912. She had been in labor for ten hours, but had had practically no pain from the start having been given a tablet of H. M. C. by her attending physician at 4.30 P. M. the previous day. She had been in the second stage for two hours, and one hour previous to my arrival forceps had been applied and forcible traction made intermittently with no progress. Chloroform had been given for one and a half hours. I removed the forceps and an examination showed the occiput to be directly posterior. Because of the large caput, in order to make a diagnosis of the position, it was necessary to pass the hand into the vagina, which was quite edematous, and without difficulty the head was at once turned to an L. O. A. position. The forceps was then reapplied to the head in the L. O. A. position and with unusually moderate traction the head was delivered. The child was profoundly asphyxiated, but respiration with the aid of the pulmotor was finally established.

While working with the baby and before the placenta was delivered, it was noted that there was considerable hemorrhage. The placenta was delivered at once by Crede's method with a continuance of the hemorrhage. Close examination revealed the fact that the bleeding was not from the vagina, but from a rent anterior to the vagina, near the urethra, and in an effort to pack this to check the bleeding, the finger followed back between the ends of the symphysis which were separated 2 1/2 inches. Pressure to the crests of the ilium was made at once and the wound in the soft parts packed with gauze. Encircling strips of adhesive plaster were put around the hips holding the severed ends of the bones in close apposition. She was catheterized for four days.

The puerperium was slow, one feature of the case being a continuously rapid pulse for two or three days, but this gradually subsided. The plaster was replaced by a specially constructed pelvic binder with straps and buckles and at the end of six weeks the union was complete. During the third week she developed a phlegmasia of the left leg and thigh with more or less constant pain over the inner aspect of the thigh. There is no pain now, but whenever she is on her feet long at a time the swelling recurs. There is no mobility of the symphysis or pain in this region.

In passing, I wish to say a word in regard to the management of occipito-posterior positions, and the absolute necessity of a positive diagnosis before forceps is applied. Occipito-posterior positions in normal-sized pelvis and head, must rotate anteriorly if birth is to be accomplished without great risk to the integrity of the soft parts. Nature does accomplish this in a large majority of cases, but only after a long, tedious labor and with great risk to the life of the child. If born as an occipito-posterior a severe tear of the perineum is practically inevitable. I am aware that there are exceptions to this rule; I have several times been astonished at the delivery of occipito-posterior cases without rotation with as little trouble as if it had been an anterior position, but these are decidedly the exceptions. Given a case with the history of no advance after one and one-half to two hours in the second stage, and an examination reveals an occiput posterior, a manual or forceps rotation will usually be very easily performed and with reapplication of the forceps in the new position the delivery can be easily accomplished. For the forceps rotation, the solid-blade instrument is much preferable.

The following abstracts of papers are given to illustrate the usual type of cases of rupture of the symphysis occurring:

Kriwski(5) states that the condition does not occur more than one in 10,000 births, and not so frequent according to some authors. Kayser(6) reports three in 94,000 births.

According to Winkel there were 124 cases altogether reported in literature up to 1907, but Kayser states that up to 1903 there were 130. The cases to the year 1898 are collected by P. Rudaux(7), this series showing twenty-seven spontaneous, seventy-one traumatic. Chrobak reports three cases out of 64,149 births.

The author states that the total number of cases reported in literature that he can find is 134.

The causes assigned are: infantilism; contracted pelvis; osteomalacia; new growths; acute and chronic inflammation; changes in the joints after severe labors; spongy condition of the joint due to pregnancy; malpositions; disparity between the diameters of the fetus and pelvis; muscular contractions affecting pelvis.

Huxley(8) reports a case, thirty-six years old, with several previous normal labors. Accidental fall two weeks previous to this labor probable factor. Very little discomfort to patient from this fall. Labor not prolonged, but much pain. Separation third day after labor caused by patient moving in bed. Probably had commenced during labor. No outward rotation of lower limbs, nor were they totally incapable of active movement.

Recovery followed rest on back with a light pelvic binder. Union had taken place between the bones within twelve months after.

The author reported two of the literature cases in which conditions were similar; *i.e.*, healthy pelvic condition, but separation occurring some time after labor owing to abnormal movement of the patient. Skiagram showing separation accompanies this report.

Loescheke (9) investigated whether the pelvis undergoes changes during pregnancy and labor, whether it is a rigid, bony girdle, or to what degree it is capable of dilatation during labor. He finds the constituents of a joint formation and a disposition to relaxation in the pubic symphysis. He considers the question of the degree of pelvic enlargement as well as of a general involvement of the entire osseous system during pregnancy. He claims that the symphysis is normally without cleft. The static relations of the pelvis vary in children and adults and the symphysis of the adult is subjected to a relative and well-marked increase in pressure greater than that of a child. If clefts appear in the symphysis they are divisible into two varieties, the first of which are the result of a degeneration of the articular disc and appear in adults of both sexes. Traumatic clefts are present only in women who have borne children and are not limited by any anatomical boundaries and result from trauma during labor. The author finds that during labor the symphysis is subject to well-marked stretching and that the increase in the pelvic inlet may amount to several square centimeters. The sacroiliac synchondrosis assumes the rôle of a joint during labor. In every pregnancy a permanent increase of the pelvis results from new growth of the bones. In multipara cases were observed in which the increase at the symphysis was more than 2 centimeters.

The author believes that the growth of the pelvic bones during pregnancy is part of a stimulus which involves the entire osseous system, and results from secretions of the ovaries, thyroid and hypophysis. He gives several statistical tables in support of his views.

Voron et Gounet(10) reports one case, an eighteen-year-old primipara. Forceps extraction. Author insists that this disjunction was due not to the intensity of the traction, but to the unilaterality of the traction on the frontal lake (lac frontal). Patient recovered after three weeks.

In the discussion Bar, the French obstetrician, said that true rupture is very rare. The most usual cause is the application of forceps in a very restricted pelvis, but on an elevated head.

Eastman(11) also quotes the number of cases in literature as about 150. Out of twenty-three cases sixteen were due to forceps delivery. Of Rudaux's ninety-eight cases, twenty-five were spontaneous and the others forceps delivery.

The author discusses the predisposing and proximate causes of rupture.

Reports one case, aged twenty-seven, para-ii. Instant before spontaneous birth snapping noise heard in room. Six weeks later operated on by crescent-shaped incision and suturing of bone with heavy silver wire. Union perfect in thirty-six days.

Brettauer(12) presented a case of fracture of symphysis pubis to New York Obstetrical Society. Aged twenty, married one year. Labor at term, March 8, membranes ruptured twenty-four hours before. March 7, bled freely entire day, weak intermittent pains. On afternoon of March 8 head had been on perineum over two hours and forceps applied. Child easily delivered. Few hours after delivery patient had severe hemorrhage, uterus packed. Packing removed three days after. Had severe chill. When author saw her, slightly delirious; temperature 104°; pulse 130; legs widely separated, active motion of them impossible. Vulvar region edematous to enormous degree. Bladder distended to its maximum. Slight meteorism; transferred to hospital. Introitus raw, covered with greenish, yellow membrane. Tear in anterior right sulcus reached clitoris leading upward to cavity filled with blood, etc. In this cavity were the fractured ends of the pubic bones; between the bones was a soft nodular mass of prolapsed tissue (urethra and bladder).

Pelvis was strapped with zinc-oxide plaster belt reaching from umbilicus to middle of thigh. Cavity irrigated daily. Catheterized one week, no blood in urine. Edema disappeared in one week. *X*-ray showed fracture of left descending ramus of pubic bone and also a fracture of symphysis to right of the synchondrosis with separation of 2 inches. In spite of straps and belts a diastasis of 1 inch persists. No evidence of fibrous union noted (April 15); seven and one-half weeks after patient permitted to walk; has distinct "waddle."

Minuchin(13) reports one case (out of 18,000 births from 1905 to 1911) in the Basle Women's Hospital.

Woman, twenty-nine, para-ii. First child 1904; second 1910. Entered clinic July 6, 1910, in labor. Spontaneous symphysis rupture found. Child extracted by forceps. Woman had recovered (without complete union of ruptured symphysis) by July 19.

The author criticises points of similarity between other cases quoted in the literature and this one.

He states that the number of cases known in literature is "about 150," but he does not give particulars.

Scheurer(14) reports one case. Primipara twenty-nine years. Forceps extraction. Patient confined March 1, 1908. Immediately after birth condition of the patient (hemorrhage, etc.) caused examination. Symphysis found ruptured. Usual treatment, tight bandages, etc. By March 23 patient had recovered so much that active movement was possible. April 24, patient able to work and without pain. Symphysis fully consolidated. This rupture appears to have been caused by an abnormal development of fetus (weight at birth 4000 gm.). Many cases in literature from same cause. Also the prolonged labor as well as the configuration and degree of solidarity of the skull of fetus.

The most important contributions to literature of the subject, as well as those here given, in recent years are:

Ahlfeld. Die Verletzungen der Beckengelenke während der Geburt und im Wochenbett. *Schmidt's Jahrbücher*, Band clxix, page 187 (1876).

Kayser. Beitrag zur Frage der Symphysenruptur. *Archiv für Gynäkologie*, Band lxx, page 50. Braun V. Fernwald. Neber

Symphysenlockerung und Symphysenrupture. *Archiv für Gynäkologie*, Band xlvii, page 104. Mayer, A. Neber die Spontanruptur der Symphyse unter der Geburt (one case). *Beiträge zur Geburtshilfe u. Gyn.*, Band xi, page 200 (1906).

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5. Kriwski, L. A. Die Ruptur der Symphyse während der Geburt. *Monatsschrift für Geburt. u. Gynäkologie*, vol. xxxi, 1910, page 456.

6. Kayser. *Archiv für Gynäkologie*, 1903, Bd. lxx.

7. Rudaux. De la rupture de la symphyse pubienne an cours de l'accouchement, Paris, 1898.

8. Huxley, F. M. Spontaneous Separation of the Symphysis Pubis. *Journal of Obstetrics and Gynecology of the Brit. Empire*, 1910, vol. xviii, page 327.

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11. Eastman, T. B. Rupture of the Symphysis pubis with report of Case, etc. *New York Medical Journal*, vol. lxxxiii, 1906, page 130.

12. Brettauer. Amer. Jour. Obst., vol. lxii, 1910, page 468.

13. Minuchin. Ueber die Ruptur der Symphysis ossium pubis unter der Geburt. *Wiener klin. Rundshau.*, vol. xxvi, 1912, page 189.

14. Scheurer, P. Ruptur der Symphyse während der Geburt. *Corresp. Blatt für Scher. Aerzte.*, 1909, vol. xxxix, page 118.

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DISCUSSION.

Dr. Edward J. Ill, Newark, N. J.—It seems to me, this condition, is not as rare as the essayist would lead us to believe, for the reason that within a year I have seen three cases. I saw two that were brought in the hospital on a Sunday morning, and the last one was last June, the patient being the sister of a doctor. They were all caused by high forceps delivery. They all had ruptures of the tissues alongside the bladder. The bladder was separated entirely from the pubic bone, and two of them had vesicovaginal fistula; one had a rupture through into the rectum; three were treated by a method which I have used quite a number of times during my lifetime and my father before me, of putting a broad rubber band around the pelvis, with corset strings in front, which is a clean way of handling the condition, and the bandages can be removed every day cleansed and put back again. These patients very soon regain their ability to walk . I am sure, I must have seen ten cases, and it never occurred to me to speak of them, as I did not know they were so rare. My father told me he had seen a great many of them in his lifetime. I think if we reported all our bad cases, we would have a good many more to report than the few that have been reported. I should think it would be a great mistake to sew the bone up during the acute stage of the illness. These wounds are terrible to behold in their raggedness. I have never seen such wounds, as one sees under these circumstances. While I have never seen a case so bad that it needed suture of the pubic bone afterward, I should think, if I had such a case, I would want to do it if the separation could not be closed otherwise. Some years ago we saw a late case in which the separation was an inch, and the union was so good that the woman had very little difficulty in walking.

Dr. Asa B. Davis, New York City.—I wish to say that I know of five cases which have not been reported. One case happened in my own experience and one in the practice of a private physician, and Dr. Morgan, of our staff, has histories of three cases. In our experience, they are rare complications in the Lying-In Hospital service. We have had something between 80,000 and 90,000 deliveries, and I have known of but two that have occurred in that number in which there was rupture of the symphysis pubis.

The case I speak of was that of a physician's wife. This was fifteen or more years ago. There were three of us in attendance. The head had partly engaged and labor had ceased to progress. I tried forceps which were still in place, and the younger man, who was well trained as an obstetrician and who now holds an important position as a surgeon, began attempts at delivery. As my back was turned to the case, I heard a distinct report and on examination I found a rupture on the right side up through the vestibule. The soft tissue was torn away from the bone and there was separation at the symphysis. There were sockets and spurs in the joint, clean cut, so that they could be seen distinctly. That woman made a slow recovery. She had difficulty in urinating for a time so that it was necessary to use the catheter. She was treated, first, by adhesive strips, and then with a belt with buckles, and later the difficulty in walking was pronounced in her case. For a time she was unable to walk, and then in about three or four months she could walk with increasing ease if she walked on a level floor. The moment she began to move up an incline or to go upstairs she would have great difficulty. She finally recovered completely and has since given birth to children without trouble.

Dr. Abraham J. Rongy, New York City.—I do not think separation of the symphysis or fracture of the pubic bone is so rare as we have been lead to believe. I know of four cases in the obstetrical service of Lebanon Hospital. In two there was spontaneous separation of the pubic arch. In one the pubic bone was separated by the after-coming head. In the fourth case, the pubic bone was fractured during the high forceps delivery. In this case the urethra was torn away from the bladder.

Two of these patients were Italian women and I suggested at the time whether the question of rickets did not have any bearing on the cases. It is well known that a great number of women are rachitic and it is a question whether the bones of the pelvis remain as strong in these patients. Separation of the symphysis usually takes place when the head is not properly engaged and in patients who have a contracted outlet and in whom the anterior segment of the pelvic outlet is shortened. In two of these cases, I found the arch of the outlet typically flat and narrow and therefore the diameter of the head and pelvis were out of proportion, and when the head wedges itself crosswise, some separation is likely to occur.

In regard to the treatment in cases of spontaneous separation, very little treatment is necessary except rest in bed and a small strip of adhesive plaster around the pelvis. In the case of fracture of the pubic bone, we had a good deal of trouble on account of the mass of tissue that placed itself between the ends of the bone. However, surgical separation of the pubic bone, like in cases of pubiotomy, give very little trouble and the patient is kept in bed not longer than fourteen or fifteen days. The longest time I have kept a patient in bed, after performing a pubiotomy, was twenty-one days, and I have performed nine pubiotomies. I do not think these patients have much trouble in walking because the pressure and weight of the body does not fall on the pubic bones. The pressure is along the spinal column.

THREE CASES.[1]

BY

ASA B. DAVIS, M. D.,
New York.

I. INTERMITTENT AND UNILATERAL CHYLURIA.

Mrs. M. G., native of Gibraltar, Spain, aged twenty-eight, para-iii, was admitted to the Lying-In Hospital, December 12, 1912, in the eighth month of her third normal pregnancy, suffering from a double lobar pneumonia, which showed the characteristic physical signs, and the high temperature, pulse and respiration, usual in that condition. Two days later convalescence began by crisis. The physical signs and temperature, pulse and respiration quickly became normal, and continued thus until her discharge, January 12, 1913. Pregnancy continued, and was in no appreciable way modified. Shortly before her discharge from the hospital it was noticed that she was passing turbid urine, slightly stained with blood. This urine proved to be chylous. She was readmitted to the hospital, February 6, 1913, to await her confinement, which took place February 18, 1913. It was without noteworthy incident. The child was well developed and lived. The patient's general health was excellent. She remained in the hospital for observation until March 19, 1913, when she was discharged with her child, in good condition. During this entire stay in the hospital, she continued to pass this chylous urine, the examination of which before delivery, showed acid reaction, specific gravity, 1020, albumin present, much fat, many blood cells, and no casts. A search for filaria sanguineous was made from specimens of blood taken at night, without result.

Cystoscopic examination by Dr. H. G. Bugbee showed the urethra, bladder and ureteral orifices normal; clear urine from the right ureter; normal cloudy urine from the left ureter. Ureters normal in length and caliber. Normal urine and function of the right kidney. Diminished function and chylous urine from the left kidney. Collargol injection of kidney pelves and ureters shows in *x*-ray picture normal outline.

The reports in full of specimens of urine, examined by Dr. Frederic E. Sondern, are as follows:

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

Separately Collected from Right Kidney.

Volume, 9 c.c.
Reaction, acid.
Sediment, very moderate.
Nature of the sediment, heavy.
Albumin, heat and acid test, very faint trace.
Amount Esbach per mile test: Same by weight.
Urea, 2.8 per cent. by weight.
Additional tests, none.

Analysis reported, March 17, 1913.
Color, amber.
Odor, not offensive.
Specific gravity, 1024.
Sugar cupric test, negative.
Chlorides, 0.8 per cent. by weight.
Freezing-point, minus ......° C.

Examination of Sediment.

Blood, small amount.
Pus, none.
Mucus, none.
Casts, none found.
Bacteria, no apparent bacteriuria.
Epithelium, numerous round cells probably from the ureter.
Crystalline and amorphous matter, none.
Other structures, none.

Separately Collected from Left Kidney.

Volume, 10 c.c.
Reaction, acid.
Sediment, moderate.
Nature of the sediment, heavy.
Albumin, heat and acid test, present.
Amount Esbach test, 2 1/2 per mile by weight.
Urea, 1.53 per cent. by weight.
Additional tests, none.

Analysis reported, March 17, 1913.
Color, chylous.
Odor, not offensive.
Specific gravity, 1015.
Sugar cupric test, negative.
Chlorides, 0.5 per cent. by weight.
Freezing-point, minus ......° C.

Examination of Sediment.

Blood, moderate amount.
Pus, none.
Mucus, none.
Casts, none found.
Bacteria, no apparent bacteriuria.
Epithelium, numerous round cells probably from the ureter.
Crystalline and amorphous matter, none.
Other structures, decided amorphous granular deposit.

Summary.—Specimen from the *right kidney:* The very faint trace of albumin seems fully accounted for by the blood cells, and no evidences of a lesion of the pelvis or parenchyma could be found.

Specimen from the *left kidney:* While the entire emulsion could not be separated with ether, this is not uncommon in specimens of chyluria. Aside from its chylous nature, the specimen contains much more albumin than the blood would account for, but no microscopic evidences of a lesion of the pelvis or parenchyma could be found. A permeability of the kidney of chyle and albumin has been reported, without the presence of filaria in either the blood or urine. Cases of unilateral chyluria have been reported by Israel (*Mitt. a. d. Grenzgeb. d. Med. und Chir.*, ii, 171, 217, 1903), Salle (*Deut. med. Woch.*, xxxv, 142, 1909) and others.

The specimens collected for phenolsulphonephthalein functional test show the following figures based on supposition that 0.006 gm. of the dye was injected.

Right kidney: First hour, 0.0015 dye—25 per cent.
Left kidney: First hour, 0.0007 dye—12 per cent.

Separately Collected from Right Kidney.

Volume, 19 c.c.
Reaction, acid.
Sediment, moderate.
Nature of the sediment, heavy.
Albumin, heat and acid test, faint trace.
Amount Esbach test, same per mile by weight.
Urea, 1.63 per cent. by weight.
Additional tests, none.

Analysis reported, April 15, 1913.
Color, pale amber.
Odor, not offensive.
Specific gravity, 1018.
Sugar cupric test, negative.
Chlorides, 0.8 per cent. by weight.
Freezing-point, minus.......° C.

Examination of Sediment.

Blood, small amount.
Pus, none
Mucus, none.
Casts, none found.
Bacteria, no apparent bacteriuria. No tubercle bacilli found.
Epithelium, numerous round cells probably from the ureter.
Crystalline and amorphous matter, none.
Other structures, none.

Separately Collected from Left Kidney.

Volume, 22 c.c.
Reaction, acid.
Sediment, moderate.
Nature of the sediment, heavy.
Albumin, heat and acid test, faint trace.
Amount Esbach test, same per mile by weight.
Urea, 1.56 per cent. by weight.
Additional tests, none.

Analysis reported, April 15, 1913.
Color, pale amber.
Odor, not offensive.
Specific gravity, 1017.
Sugar cupric test, negative.
Chlorides, 0.8 per cent. by weight.
Freezing-point, minus....... ° C.

Examination of Sediment.

Blood, small amount.
Pus, none.
Mucus, none.
Casts, very few hyaline casts.
Bacteria, no apparent bacteriuria. No tubercle bacilli found.
Epithelium, numerous round cells probably from the ureter.
Crystalline and amorphous matter, none.
Other structures, none.

Bladder Specimen.

Reaction, acid.
Sediment, very moderate.
Nature of the sediment, heavy.
Albumin, heat and acid test, faint trace. Nitromagnesium test, faint trace.
Amount Esbach test, same per mile by weight.
Bile pigment, absent.
Urea, 1.29 per cent. by weight.
Indican, no excess.

Analysis reported, April 15, 1913.
Color, light amber.
Odor, not offensive.
Specific gravity, 1014.
Sugar cupric test, negative. Bismuth test, negative.
Acetone, absent.
Chlorides, 0.6 per cent. by weight.
Phosphates, no excess.

Examination of Sediment.

Blood, none.
Pus, none.
Mucus, small amount.
Casts, few hyaline casts.
Bacteria, no apparent bacteriuria.
Epithelium, some bladder cells.
Crystalline and amorphous matter, none.
Other structures, none.

Summary.—Specimen from *right kidney:* The faint trace of albumin seems fully accounted for by the blood cells and no evidences of a lesion of the pelvis or parenchyma could be found.

Specimen from *left kidney*: This specimen also shows no more albumin than the blood would seem to account for, but very few hyaline casts are present with practically the same amount of urine, specific gravity and amount of urea noted in the specimen from the other kidney. Chyle could not be demonstrated.

The specimens collected for the phenolsulphonephthalein functional test show the following figures based on supposition that 0.006 gm. of the dye was injected.

Right kidney: First hour, 18 per cent. dye.
Left kidney: First hour, 20 per cent. dye.

The *bladder specimen* shows nothing noteworthy in addition to the above.

The patient states that she first noticed the change in her urine at about her fifteenth year, near the time of her first menstruation—that it was not constant in its appearance. The chylous condition would be absent for years at a time, but would reappear after any indulgence in anger or emotion. Palpation has never revealed tenderness or enlargement of the left kidney. The chyluria was absent for several years, but reappeared at the death of her mother ten years ago, and was present for several months. It was present during the entire time of her first pregnancy, and for nine months thereafter. During and after her second pregnancy, it was absent. There has been no noticeable difference in the character of the night and the day urine. Now, September 13, 1913, there is a report that the urine has been clear for five days, and that the general health is good. She is nursing her infant.

D. V. Salle, in *Deutsche medizinische Wochenschrift,* No. 4, Jahrg. 35, p. 142, Berlin, 1909, discusses chyluria, which is a common disease in the tropics, but very rare in Europe. He maintains that the tropical form always depends upon the presence of the parasite, filaria sanguineous, while the presence of this parasite has never been proven in any European case. It is characterized by enlargement and obstruction of the lymph vessels, forming abnormal communications between the lymph and chylous vessels. In the tropical countries the circulation of chyle is changed, and it is partly discharged directly to the urinary organs by the lymph vessels. He reports the case of a male, twenty-five, recently returned from Africa, in whom no filaria were found—pain on pressure, in the region of the left kidney—noticeable palpitation. The quantity of fat in the urine varies considerably, sometimes disappearing entirely, and is invariably much greater after rest than after motion. As a rule, the urine is clear in the daytime, except when the patient is forced to rest in a sitting position, and milky at night and in the morning. It is found that fat is secreted by the left kidney only.

He concludes that the cause of the disease is either chylous blood and abnormal metabolism, or a change in the renal function, and, further, that chyle is discharged by anatomical lesions either through the thoracic duct to the lymph vessels of the left side urinary organs, or direct to the pelvis of the kidney or ureter.

Ernest R. Frank (*Wiener med. Wochenschrift*, July 1, 1909) reports a case of European chyluria in a male, forty years of age. Milky urine in the morning only, and the chylous urine comes from the right ureter only. He concludes that there must be a communication between the chylous vessels and the urinary passage.

J. Huatek (*Deutsche med. Wochenschrift*, Bd. xxxvi, No. 17, 1910, p. 794) reports a case of chyluria in a married woman, thirty-five years old, and says that the left kidney secretes four times as much fat as the right. No parasites were found in his case.

J. Veis (*Berl. klinischer Wochenschrift*, Bd. xl, No. 27, 1905) describes a case in which chyluria was noticeable during pregnancy. Pregnancy was forcibly interrupted, rather because of an excessive albuminuria, than because of the chyluria.

II. MYOMECTOMY AT THE EIGHTH WEEK, PREGNANCY NOT INTERRUPTED; NORMAL DELIVERY AT TERM.

Mrs. X. consulted me early in August, 1912, giving the following history: Native of U. S., aged thirty, married, para-i. Menstruation began the fifteenth year, twenty-eight-day type, always scant and painful. Intervals somewhat shorter between the periods during the past three years. The last menstruation was July 12, 1912. She was exhibiting the usual symptoms of early pregnancy. No examination was made at this time. There was nothing noteworthy found by urine analysis, and the general health was good.

September 4, 1912, she again appeared for advice, and was evidently quite ill. This was in the eighth week from her last menstruation. She stated that on Aug. 29, 1912, she began to have pains in the lower lumbar and sacral regions, and, at first, a slight discharge of blood from the vagina. Sometimes considerable pieces of clotted blood passed. There would be periods of twenty-four hours when she would be practically free from pain and only slight blood-stained discharge. Then the symptoms would recur. This condition had continued up to the time of her visit. She had noticed a tender mass just above the symphysis. Ectopic pregnancy was thought to be the condition most probably existing. No examination was made, but she was sent at once to the Private Pavilion of the Lying-In Hospital, where any emergency could be met. There it was found that there was a large, hard, round tumor, the size of a fetal head, in the posterior and upper part of the pelvis, which crowded the cervix up back of the symphysis, and the remainder of the pregnant uterus was in the midline above the symphysis, and was the tender mass which the patient had already palpated.

She was prepared for operation to take place the following morning, when the abdomen was opened in the lower midline, and the uterus, with tumor attached, were lifted out and turned forward. The tumor was found to take its origin from the lower part of the posterior wall of the uterus, a little to the left of the median line and below the fundus. It was almost entirely outside of the uterine wall, being attached to it for about an inch and a half, without a pedicle, but it extended into the uterine wall about two-thirds of the thickness of the uterus at that point. It was carefully dissected away and the wound was closed with a few interrupted chromic gut sutures, and these were buried by a continuous Cushing stitch suture.

The uterus was evidently pregnant about eight weeks. It was replaced in the pelvis, and the abdomen was closed in three layers.

Recovery was without rise of temperature. There was no more pain or vaginal bleeding. The wounds closed by primary union and the patient was discharged from the hospital on September 21, 1912, still pregnant and in good condition.

Her pregnancy was uneventful thereafter, save for slight bleeding during November 2 and 3, and she was confined in another city after a normal labor, April 27, 1913.

The pathologist reports: Tumor generally rounded, lobulated and measures 12×7×7 cm. Hard, made up of cellular, fibrous tissue. There are certain areas throughout tumor which show some necrosis. No evidence of malignancy.

Diagnosis.—Myofibroma.

III. ACUTE DILATATION OF THE STOMACH FOLLOWING VENTRAL FIXATION OF THE UTERUS; LONG LABOR; LOW FORCEPS DELIVERY; RECOVERY.

M. R., Russian, aged thirty-four, para-i, married, was admitted to the wards of the Second Division of the Lying-In Hospital, at 3 A. M., December 21, 1912, stating that she had been in active labor since six o'clock the night before. Her last menstruation was in April, 1912. She was evidently at full term. Her abdomen was very large and pendulous, and there was a broad cicatrix, extending from the umbilicus to the pubes. It was learned from the histories of another hospital that she had undergone the following operations there in April, 1908: Dilatation and curettage, myomectomy and appendectomy.

It was found upon examination that the vertex was L. O. A., partly engaged at the brim of a large pelvis. Fetal heart 128, left and below. Uterine contractions forcible every five minutes. The cervix was three fingers dilated and the membranes ruptured. Active labor continued until 5 P. M., twenty-three hours from its onset, before cervical dilatation was complete. Then the vertex quickly descended to the perineum, where it remained until 8.30 P. M., and the soft tissues at the vulva outlet become very edematous. She was then delivered by low forceps operation. The edematous perineum was lacerated down to the muscles and was repaired with three silkworm-gut sutures. The child weighed 3900 gm. It was well developed, it lived and was nursed by its mother.

The patient showed marked exhaustion. On the following day the abdomen began to distend, particularly in the region of the stomach, and she vomited a small quantity of brown fluid. An enema, which was given, was effectual in removing gas and feces. Her temperature was 101.6°, pulse 120, and respiration 28. Her distress was marked and increasing. She had the appearance of a very ill woman. On the following morning, Dec. 23, 1912, the distention had increased. The whole abdomen was tense and the outline of the greatly distended stomach was visible with its lower border extending to the umbilicus. Lavage brought away about a quart of brown fluid and much gas, giving the patient noticeable relief. An ice-coil was placed on the abdomen. Lavage was repeated four hours later, resulting in progressive improvement. On the third day postpartum lavage was found to be necessary but twice. She was given strychnine sulph., gr. 1/30, three times a day. Her temperature remained between 101.5° and 102°, pulse 120, and respiration 26 to 28 until noon of the fourth day, when these were as follows: temperature 99°, pulse 95, respiration 24. Daily lavage was continued until the ninth day. This brought away undigested food and glairy mucus, indicating slow digestive processes. She was transferred to the solarium on her fourteenth day, and discharged from the hospital on her twenty-eighth day postpartum, in good condition.

The operations which this patient underwent in 1908 probably resulted in ventral suspension of the uterus.

It is noticeable that pregnant women who have had ventral suspension, either are unable to dilate the cervix at all, or it is, in most cases, a very long, tedious process. The first stage of labor is unduly prolonged. And we have found the results of some form of uterine suspension the main indication for Cesarean section in nine cases.

42 EAST THIRTY-FIFTH STREET.

DISCUSSION.

Dr. Maurice I. Rosenthal, Fort Wayne, Indiana.—In connection with the report of Dr. Davis, I may add two cases of pregnancy complicated by tumor. One was a Mrs. W., second pregnancy, who was about thirty-four years of age. She was referred to the hospital as a case of ectopic gestation. The history given is as follows: Her last menstruation had been somewhat scanty, and she had missed her menstrual periods twice since. During the day she was taken with pain in the pelvis and later developed some hemorrhage. Examination revealed a pregnant uterus between the third and fourth month, with a tumor occupying the left posterior aspect of the uterus. A diagnosis of threatened abortion due to pressure of a fibroid tumor was made. Laparotomy was done, and a tumor the size of an orange was enucleated from the posterior left lateral aspect of the uterus, situated low down, extending well into the muscularis of the uterus. The wound was sutured, and she made an uneventful recovery, and was delivered of a living boy at term.

Another case was one of pregnancy complicated by an unusually large intraligamentous cyst. The woman was brought into the hospital with a diagnosis of pregnancy near term, and gave a history of having missed menstruation about four times. This intraligamentous tumor was unusually large and was removed in the usual manner. The patient went on to uneventful recovery, is now near term but has not yet been delivered. She is a primipara, twenty-five years of age.

Dr. Charles E. Ruth, Des Moines, Iowa.—I have had no experience with chyluria in this country, but came considerably in contact with it in Porto Rico, where I saw it periodically and sometimes very persistently, associated not only with pregnancy, but independent of it, in individuals practically of all ages. Where pure chyluria exists in this country, I would feel that a very careful examination should be made with reference to the possibilities of filaria as the cause.

I have done but three abdominal operations for tumors complicating pregnancy. One of them was a myomectomy. All of them were satisfactory in so far that the patients recovered and pregnancy went on undisturbed.

The last case that Dr. Davis reported interested me more than any of the others, because I am satisfied that this subject of acute dilatation of the stomach is as important as any topic that can be brought before this association.

I prepared a paper on this subject last year, but was unable to be present at the meeting to read it, and naturally I am interested in the subject. I believe it should interest the general practitioner quite as much as the surgeon, the obstetrician and gynecologist. A particularly important point that I want to bring out in my part of the discussion is, that as physicians and surgeons, in our relation with the various hospital services and the training of nurses, we should be very insistent and persistent in our routine examination of the condition of the upper abdomen in all severe illnesses and after all operations, abdominal particularly, and after all obstetric cases, to note the *first indication*, not the late manifestations when the stomach is greatly distended and the patient is erucatating black grumous material, and when the pulse is greatly weakened and prostration is extreme. By acting promptly we will save the lives of many if we slip our hands under the covers and note any distention of the abdomen. Immediately pass a stomach tube when there is any marked distress or eructation of gas, and train the nurse to make these observations during the day and night. By so doing we will prevent our patients passing into *extremis* with a terrific struggle to save life. The stomach tube offers the only practical relief in these cases, and in its proper early use we will avoid the chagrin of these cases being allowed to go to the verge of the grave. In other words, we must prevent the complete permanent paralysis of overdistention.

Dr. Herman E. Hayd, Buffalo, New York.—I feel that the surgeon and physician are worrying themselves altogether too much as to the necessity for surgical intervention for fibroid tumors, complicating pregnancy. It is surprising to see how large a tumor can be, and how fast it grows, and yet offer no obstruction whatever to the future delivery of the child, and unless the tumor is located in the cervix, or away down in the lower uterine segment or extending outward into the broad ligament, I do not believe that we are justified in doing any operation when a woman is pregnant, on account of the possibilities of prospective danger in her delivery, and that was brought particularly to my mind only a few weeks ago when I operated on a woman who was delivered four months before of a dead baby. She had a fibroid in her uterus that was as large as a turnip. There was no difficulty whatsoever in the delivery of the child.

Again, it is surprising to see what an amount of manipulation and what an amount of injury the pregnant uterus will permit when we do operate where the condition is not associated with any septic process. We can remove large tumors from the uterus, and yet pregnancy will be in no way interfered with, and we also know how little we can manipulate if the woman has typhoid fever or has a suppurative appendicitis. We operate on these cases of appendicitis and they abort or we attend a woman with typhoid fever and she will abort with the most trivial operative intervention.

I had an experience which I reported to the Association of a woman who had a large fibroid tumor growing in the upper zone of the uterus that was injured by the kick of her husband. He came home one day drunk and kicked her, so that there was marked discoloration in the right side when I saw her five days after the injury. There was a large mass in the right side which, at first, gave me the impression that it was appendicitis. She had a temperature of 99.5°, and as the swelling was excruciatingly tender, and the woman seven months pregnant, I advised an operation. After opening the abdomen over the swelling, over the ordinary appendiceal site, I delivered a tumor larger than my fist, which was attached by a small pedicle not larger than my thumb; it was smooth, without adhesions; it did not show any particular evidence on the surface of any injury, and I felt very much chagrined to think I had subjected this woman to an operation when she would have delivered herself without any difficulty but on account of the extreme tenderness and the history of the injury, and the slight temperature, I made up my mind the case was a suppurating fibroid and should be operated. On delivering the tumor there were no evidences of suppuration upon the surface, but before closing the abdomen I said to the nurse, open the tumor, and in the center was a teaspoonful of pus, so the indications of the operation were self-evident.

An interesting feature in connection with the case was the difficulty I had in stopping hemorrhage. I separated the peritoneum from the pedicle, tied it off carefully and then sewed over with a dull needle, but where the needle punctured the uterus there was oozing and so profuse that I was afraid to close the wound, and finally in my desperation I said to the husband who was in the anteroom that I was afraid to close the wound up unless I applied a forceps and in doing that I realized I perhaps would provoke a premature delivery. Nevertheless, I applied a bent ligament clamp to the pedicle, left it on for twenty-four hours, removed it the next day, the woman went on and delivered herself of a 14-pound baby, seven weeks afterward.

I saw this woman a few weeks ago. The baby is a beautiful boy, now thirteen months old, so it is possible for one to do all kinds of work on a pregnant uterus and yet in view of that possibility, I am sure we are operating altogether too often, because the difficulties for future delivery in most cases are very, very slight. A tumor even of large size lifts itself up and it often grows rapidly. That we know to be the case particularly with a myoma, not only from the increased growth of the muscle tissue, but also from so much associated edema. Nevertheless, very seldom, unless the tumor is in the cervix, away down in the lower segment of the uterus, does it offer any obstacle to delivery.

Dr. Gordon K. Dickinson, Jersey City, N. J.—There are two points that interest me in these papers. One is a fact not generally known and brought out by Leaf of England, namely, that there is a perfect anastomosis between the veins and the lymphatics. The lymphatics do not run independently to the major trunks and then into the veins, but anastomose here and there through the body, there being a perfect intercommunication. This may also account for the entrance of chyle from the receptaculum chyli into the renal vein.

The description of dilatation of the stomach interests me because we occasionally see it. It is very tragic. When we do meet it, we must be prompt in passing our hands under the bedclothes and feeling the epigastrium. Of course, we have conditions which simulate dilatation of the stomach and are more dangerous and toxic, which do not elevate the epigastrium, a dilated duodenum, for instance, and I have seen a number of such cases. In these cases you must act promptly and quickly to relieve the constriction of the duodenum at its lower third as it passes under the artery.

In these cases I have been in the habit of adding to the lavage of the stomach elevation of the foot of the bed. It is wonderful how homeopathic internes are when you tell them to elevate the foot of the bed. They will elevate it a foot or so. You really want an exaggerated Trendelenburg position, putting the head low and the feet high until you have unlocked the duodenum, until there is a perfect collapse of it by position and lavage, and then you will obtain some success.

Dr. Hugo O. Pantzer, Indianapolis, Indiana.—I wish to speak in emphasis of the position taken by Dr. Hayd. I have had fourteen cases where the waiting policy was pursued in cases of pregnancy complicated by tumors, and all passed to full term and safe delivery except one. In this case, a primipara, there was a fibroid which subsequently necrosed during childbed. The ineffectual attempts of the uterus to expel this mass called for operative interference; the vaginal removal being accomplished with recovery of the patient. The intramural location of this tumor precluded a conservative operation during pregnancy. Had this been attempted it would have ended in an hysterectomy. This patient has had another child since!

Dr. Davis (closing the discussion).—I would like to bring out in this particular case of myomectomy the report of the pathologist. He states that all through this tumor there were necrotic areas, and my own report was that the patient was very ill. She was evidently more ill than could be accounted for by pressure of this tumor upon the growing uterus. In her case I think she would have had an abortion. She might have overcome the necrosis if the abortion had taken place, but it seemed to us that it was necessary to operate in this particular case and remove the fibroid tumor.

Within the last month I have watched a patient through to term who had a pelvis full of fibroid tumors. There was also one up on the left side near the fundus as large as an orange, and those in the pelvis were so large and filled the pelvis so full that a funnel-like opening for the rectum was about all the passage there was through the pelvis. She was delivered by Cesarean section and made a good recovery. We do not remove fibroids at the time of Cesarean section. We consider the operation of delivery is sufficient for mother and child. At some subsequent convenient time we remove the fibroids if that is necessary. The edema goes down and the vascularity and the size of the tumor is much diminished, and we wait for that.

It is of interest in this case to notice that she did not become pregnant for fifteen years. She had one child fifteen years ago, but not another pregnancy until the present one. What happened there is undoubtedly this: after the delivery of the first child, the fibroids grew in such a way that they closed the cervical canal; they continued growing until they reached a size sufficient to open the cervical canal and allow conception to take place.

Dr. Maurice I. Rosenthal, Fort Wayne, Indiana.—In my previous remarks, if I did not say, I intended to say that the tumor was situated in the lower left portion of the uterus, and by reason of its pressure was bringing about abortion, and was in such a position that it would have been obstructive to labor and for these reasons it was enucleated.

CONSERVATISM IN OPERATIONS FOR ACUTE INFLAMMATORY PELVIC DISEASE.[1]

BY
BUDD VAN SWERINGEN, M. D.,
Fort Wayne, Ind.

The word "acute" in the title is not intended to mean the very early days of pelvic infection, but rather that stage in the progress of the disease when the constitutional symptoms are beginning to subside, as will be brought out later.

Much has been written about conservative operations on the tubes and ovaries when they are the subject of chronic affections. They have been resected, and the uterine and ovarian ends rendered patulous when closed by inflammation.

Ovaries have been subjected to various procedures, when the seat of chronic disease, designed to preserve or restore their function. There has been little said, however, about attempted conservation of structures the subject of acute, and apparently much greater or more extensive pathology.

It is the purpose of this effort to point out the possibility of structures, which have heretofore been considered hopelessly destroyed by inflammation, returning to a state wherein normal function is probable.

We have all seen patients with acute salpingitis presenting a palpable mass on one or both sides of the pelvis who refused operation and recovered sufficiently to bear children. Yet we have all been guilty of removing both tubes and leaving but a very small piece of ovarian tissue in cases where the trouble evidently began on one side and the other became involved only secondarily. Or, as in a case which occurred in my practice a number of years ago, an appendiceal abscess was opened and drained in a young girl, fourteen years of age. The drainage tract was allowed to close too soon and a year later a large abscess was discovered in the pelvis. It was opened by a median incision. After the pus was evacuated, the ovaries and tubes were found so matted together that it seemed imperative to take them out. The tubes were much enlarged; their walls were infiltrated, edematous and friable. They were only affected secondarily, however, and not the mucous lining. Were I to operate that particular case to-day I certainly would not remove both tubes and ovaries. Experience has taught me better.

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

It must be remembered that structures the seat of acute inflammations tend to more or less complete recovery. The edema disappears, the discharge lessens and finally ceases, and it is not every case that is left with the lumen of the tube strictured and occluded. Even in case they are so left, after the subsidence of the inflammation they may be inoffensive and symptomless. Ovaries which are found surrounded by exudate and adhesions may be liberated, the adhesions wiped off, retention cysts evacuated and the ovary allowed to remain. Many of these will subsequently prove themselves capable of discharging ova.

There seems to be a difference of opinion and practice among gynecologists in the method of handling these cases.

I. S. Stone (*J. A. M. A.*, March 1, 1913), in an article on "The Conservative Treatment of Salpingitis by Uterine Injection," says he has forcibly injected a 25 per cent. alcoholic solution of tincture of iodine into the uterus, forcing some of the solution out through the tubes in most cases. This injection is immediately followed by laparotomy. The iodine solution is seen in the culdesac. If the tube is to be saved, the same solution is forcibly injected down the tube toward the uterus. Two pregnancies are reported as following this procedure. No shock or other ill effect is said to follow.

Lörincz (*Gyogyaszat*, liii, 40) uses a 2 per cent. solution of argentamine injected into the cavity of the uterus. He keeps the patient in bed five or six weeks, and uses twenty-five to forty injections. If not cured by that time he operates. He reports good results from this method.

Edward Reynolds of Boston (*Surg. Gyn. and Obst.*, vol. viv, p. 255), says: "It seems to me that we should, however, make a sharp distinction between the conservation of parts of diseased tubes and similar conservation of the ovaries. In my experience, the two operations are of different values. Though the conservation of the tubes is a field worth cultivating, I am not yet able to feel that the prospect of obtaining functional activity in tubes which have been once inflamed is any too good; on the other hand, my experience leads me to believe that the prognosis for obtaining an absence of symptomatology and a restoration of the enlarged ovaries is extremely good."

Montgomery's Gynecology, 383, says that "conservative treatment may consist in breaking up adhesions; reopening the orifice of the tube; salpingostomy; or partial resection of the tube itself, thus shortening it and permitting the removal of such portions as are prejudicial to health." This evidently applies to old cases.

On the other hand, note the ultraconservative statements of Ashton, Practice of Gynecology, p. 513. "The conservative modern treatment of infections, involving the uterine appendages and the pelvic structures, is a marked advance in the surgery of the female pelvis. The former practice of early operative interference in these cases not only was attended by a high mortality, but was also responsible for the unnecessary sacrifice of the organs of procreation. The treatment is based upon the following facts:

"That many patients recover their health and the pelvic organs are spontaneously restored to a normal condition without the aid of operative measures.

"That an operation during the acute stages of a pelvic inflammation is attended by a high mortality and the sacrifice of organs that might otherwise be saved. Many women recover their health and the pelvic organs resume their normal functions without an operation. A number of women who have had gonorrheal or septic inflammation of the uterine adnexa have recovered spontaneously and borne children. The question of recovery depends upon the amount of damage done to the tubal mucosa and ovaries and to the extent and character of the parietal and visceral adhesions."

Ashton also says that even in the presence of gross lesions, as tubal or tuboovarian abscess, recovery has occurred, and he adds that this is especially true in septic infections which cause but little injury to the tubal mucosa, and very large pelvic exudates have been known to disappear in time without the aid of surgery.

It is rather between these extremes that I find myself at this time. I do not recommend early operation in any pelvic infection. The danger is greater than if the body is allowed time to deal with the invading germ by establishing its own protecting mechanism.

On the other hand, one should not allow a large pelvic exudate or a tuboovarian abscess to remain until absorbed. That means chronic invalidism. Pus should be evacuated as soon as it is safe to do so. But when once inside the abdomen for this purpose it is wrong to think that all pathology present must be removed by the knife. Ample provision for drainage and the ablation of the original focus will be sufficient and save many a tube and ovary which will result in much greater peace and happiness to the patient.

The following cases were instrumental in bringing me to my present convictions.

Mrs. B. W., referred by Dr. O. P. Franks of Churubusco, is a young woman, twenty-two years of age, who was always well as a girl. She was delivered of her first child January 16, 1913, after a normal labor. On the 23d, she began to have fever and in a few days received an injection of phylacogens (mixed). The reaction developed promptly, but the expected improvement did not appear. Her temperature frequently reached 103° and 104° F. Her pulse rose rapidly and continued high. The phylacogens were twice repeated with similar discouraging results and she was brought to the Lutheran Hospital on March 14 with a leukocytosis of 17,300 of which 86 percent. were polynuclears. A tender mass was present in the right fornix, and the abdomen was distended. She was markedly septic. On opening the abdomen the omentum was found adherent to the anterior pelvic wall on the right side. When it was liberated several ounces of pus escaped. The thickened omental mass was removed. This uncovered the uterus, a process of which was found adherent to the anterior pelvic wall on the right side above the bladder. A true diverticulum had been produced resembling the case reported before this association last year, save that the apex of the cone-shaped diverticulum was adherent to the right anterior wall of the pelvis instead of the cecum and appendix. The right tube was very much infiltrated and thickened. It seemed to leave the body of the uterus on its posterior surface, owing to the distortion produced by the adherent diverticulum. When the uterus was freed a large granulating surface was revealed on the pelvic wall and uterus. Owing to her desperate condition at the time no attempt was made to remove the uterus or tube, but a large gauze pack was introduced. She rallied and made a good recovery, no further operation becoming necessary.

Contrary to the case of diverticulum reported last year, which began in the sixth month of uterogestation in adhesions due to an appendicitis, this case did not develop until a week following delivery. The uterus at this time is large and soft. Pus escaping from the right tube might easily be responsible for the pathology present.

The value of conservatism in this case is apparent. A more prolonged or severe operation would have killed the patient. Then, too, without the removal of structures which seemed irrevocably lost by disease, she remains at this time symptomatically well.

Mrs. F. K., thirty-one years of age, referred by Dr. G. M. Brattain of Antwerp, O. Nothing of importance in the family history. She is the mother of three children, the youngest being five years of age. She has had several self-induced miscarriages from which she thought she had made a satisfactory recovery. The regular menstrual period appeared on July 4 and continued the usual time. A flow reappeared on the 14th, although she did not consider herself pregnant and had not interfered with the uterus. The flow was profuse. After a few days a chill occurred, followed by fever and abdominal tenderness. The pulse and temperature were high and the abdomen distended. On admission the pulse was 96 and temperature 100° F.

Abdomen universally tympanitic. Tenderness more marked in the right flank. On opening the belly a large abscess was evacuated originating from the left tube. The tube and ovary were finally removed *en masse*. The right tube was much enlarged and adherent to the under surface of the broad ligament. The right ovary was also delivered from a mass of adhesions. These organs had formed part of the wall of the abscess cavity. As they bore no evidence of disease of the mucosa, but were only involved secondarily, they were allowed to remain.

Large gauze drains were inserted, one going to the culdesac, one in front of the broad ligament on the left side, and one to the right tube and ovary.

Up to this time her progress has been perfectly satisfactory, fully as much so as if we had deprived her of the right ovary and tube.

208 WASHINGTON BOULEVARD.

DISCUSSION.

DR. DOUGLAS C. MORIARTA, Saratoga Springs, N. Y.—This subject is a very important one, and as I listened to the paper the first thought that occurred to me was, what *is* conservative surgery in the pelvis for acute infections. First, I think it is very important to make a differential diagnosis of the condition, and surely we must differentiate between an exudate and tubal infection or ovarian abscess; and I believe that in a case of acute infection it is not wise to open the abdomen. I think if we open from below and drain, we conserve the tissues, and if it is an exudate, we are very much better off than to open from above. If it is a tubal infection, we can still open from below, drain, and so conserve the tissues; later of course we must do a secondary operation, for draining, as you all know, never cures a pyosalpinx. In these pelvic infections we apparently have forgotten the work of Pryor, who opened these cases from below, used iodoform and drained. To reiterate, the operation from above in acute inflammatory disease, in my judgment, is seldom indicated, and is always an operation of high mortality.

DR. GORDON K. DICKINSON, Jersey City, N. J.—Conservatism is a game that I have been trying for some years, and I will say that the majority of women do not thank you for it. In the inflammatory conditions we meet, whether due to the streptococcus or gonococcus, you can open the abdomen; you can go in below or above; you can open the tubes and inject them with tincture of iodine or with what other antiseptics you wish; you can clean things up, but you have left a condition as you find in appendicitis, to which Deaver has called our attention, and that is the organization of lymph over the ovary. What follows?

The Graffian follicle distends but cannot burst, cannot be relieved, and one after the other enlarges and there is, perchance, a condition of tension, and as I see the pathology of pain in the female pelvis, I translate it into tension. With both ovaries cramped, with distended Graffian follicles, few of them are able to protrude through and burst, you have a condition of tension which is the first cause of chronic ovaritis. These women, if you can save the tubes, do not improve, but saving the ovaries to be subsequently transformed into a condition of tension and chronic ovaritis brings them back to your office and you have to operate again and remove them.

Dr. James N. West, New York City.—I have listened to the paper of Dr. Van Sweringen with great interest because it has been a subject to which I have paid considerable attention, and a number of years ago, when we were practising conservative surgery upon tubes and ovaries, I followed out my work in about 100 cases of conservative surgery on the tubes and ovaries. I found that women who had one good tube bore children, and that in a number of cases where I dissected both tubes and opened them, only two cases became pregnant. Just at that time Kahn, of Paris, had written an exhaustive monograph on the subject and had found only thirteen cases mentioned in all the literature of women who had had both tubes resected and had borne children afterward. I found in following up this conservative work on the tubes and the ovaries my patients suffered oftentimes with symptoms that were as aggravating as before; that is, they suffered almost as much pain and discomfort as they did before they were operated upon.

I believe I am going somewhat afield from the subject, which was acute infection, but this conservative work was referred to in connection with chronic infection of the tubes and ovaries. The doctor believes in exactly the same thing as I do in handling these cases, particularly those of infections, conservatively. I do not operate upon such cases until I am convinced that pus collection has taken place, and that the patient is beginning to suffer from the toxemia of absorption, and that other structures are beginning to be invaded. I treat the case conservatively at the beginning.

I had an extremely interesting experience last winter of treating two cases with phylacogen, in one of which the symptoms entirely subsided and the woman has remained well, but in the other one in which the symptoms subsided, after three weeks in the hospital I found masses in both sides, and I operated on that woman because she had to earn her own living, and I did not like to turn her out of the hospital with pus collections in the pelvis. Apparently resolution was going on. I found no actual collection of pus, but I removed the tubes in that case, and I saw in all probability, that that patient would have recovered entirely if I had left her tubes. Perhaps I did not exactly understand the doctor, but I think he said he never operated on any acute pelvic infection. I could not go quite that far, because I believe in pelvic abscesses it is very essential to operate early, for in my experience pelvic abscesses forming in the culdesac do so rapidly and are very dangerous. I have known of several cases that have not been operated on early, having ruptured, and the patients having died quickly from septic peritonitis. Therefore, I think that is an exception to the doctor's rule, but perhaps he referred more particularly to infection of the tubes and not to pelvic abscesses.

Dr. Edward Joseph Ill, Newark, N. J.—It was not my intention to speak on this subject, as I have spoken on it so frequently before this Association, but if I understood the reader of the paper rightly, he talked of acute inflammatory conditions only.

A good many years ago, Dr. Carstens reported that the average death rate from operations in the acute cases was about 17 per cent.; this meant his own cases. Others have had worse experience. I know in a great many hands the mortality was 25, 30 and even 40 per cent.

Very soon after Tait recommended the removal of pus tubes, I went around and asked old doctors whose experience would permit me to have some faith in what they said, what became of those women who had had large pelvic exudates (who had inflammatory masses in the pelvis)—what became of them eventually? They told me so and so has had two babies since, and this one has had one baby since, and the other one has been well ever since. Then came the paper of Dr. Carstens with a large death rate, and I promptly stopped operating on pus tubes, and I had to substitute something to get my patients well.

There were two kinds of ways I tried of keeping these women well. One was purely medical, the other surgical, to open in the culdesac abscesses. In the vast majority of cases you can succeed by the medical treatment. I dislike to tell you what we did, but it has been so successful with us that I want to reiterate it although I read a paper on it some years ago before this association. When we get an acute case of pus tubes we put the patient to bed. The patient is usually very sick. We paint the roof of the vagina with cantharides collodion, raising a big blister. For years we did not know why this had such a beneficial influence on these cases, but it is due to local hyperleukocytosis, and this carries the poison away. The edema rapidly disappeared. We followed that up with treatments of iodine and glycerin, hot douches, saline purgatives, and if it was necessary we repeated the application of cantharides collodion. We put an application of the fly blister above Poupart's ligament. There is nothing to relieve pain more than fly blisters. When the fever has disappeared and when the patient's pain is easy, and we are very sure we are not lighting up a new trouble, we massage these organs. Our American women will not tolerate the Thure Brand method of massage. It is painful to them. We put the patient in the Trendelenburg position and put a bag of mercury into the vagina weighing 3 or 4 pounds, and leave it in three or four minutes to start with. The next day we leave it in five or six minutes, and if there are no symptoms we leave it in half an hour. The result is that we get intermittent pressure with every respiratory movement, drive out the edema and increase the circulation. We do the same thing as a surgeon does when he puts a tight bandage on a knee-joint, when there is inflammatory trouble, or where one massages a joint. It is astonishing how well these patients will do, and if you have any patients on whom you want to try this treatment, do so at the first opportunity.

As to the permanent results, the vast majority of cases are permanently well. They do not come back to have their tubes and ovaries removed. Do any of them die? I have never seen one of them die during the treatment. Those cases that have recurrent inflammations that go along for a long time, say three or four months, then recur and recur again, are a hopeless task for conservation. They must have some operative treatment. I reported 120 operations of that kind where we removed a portion of the tube. At the time Dr. Polk, of New York, and Dr. Burrage, of Boston, were interested in the same subject. Out of my 120 cases fourteen had children. I have never succeeded before or since of having women become pregnant who had not been pregnant before.

Dr. Charles E. Ruth, Des Moines, Iowa.—I take it from the doctor's paper he refers particularly to the acute inflammatory gonorrheal infection involving the tubes and ovaries. In those cases I am sure that Dr. Van Sweringen takes the proper stand, if my experience is worth anything and that of Dr. Ill who just spoke. No mortality without operation in the acute cases and a mortality of 17 per cent. following operations in these acute inflammatory conditions of the ovaries and tubes should require little further comment, but the doctor did not exclude those other inflammatory conditions that do not so readily obey the common law of the destruction of living organisms in their own excreta, so that we can if necessary, operate safely several weeks or months later if occasion demands. In streptococcic and staphylococcic infections, the acute ones, from whatever cause, we have a different problem. These are the cases of acute inflammation in which we used the sharp, and then the dull curet, and have now abandoned that because by doing so we simply opened up new areas for infection. I remember some of my earlier experiences in this regard. I recall three such cases I had within six weeks. It was very near the time when Dr. Henrotin made the statement that a man who perforated the uterus in doing a curetment was criminally careless, and the next time he did a curetment he perforated the uterus. I perforated the uterus in cureting a case four months after an abortion. I have in mind three cases in which with slight force I put my finger through the uterus, in different directions, and it is in these cases that the conservatism, as advocated by the essayist, stands us well in hand. Sometimes the septic process has bored holes in the uterus in different directions, as well as having extended into the cellular and connective tissue, and in these cases the course of treatment advocated by the last speaker is not efficient, but incisions into the culdesac and drainage or dilating carefully, and introducing a double tubal drainage, not packing in gauze drains that will produce obstruction, we will not get the best results. Gauze packing in many cases will produce obstruction and should never be used to drain thick pus.

Dr. Van Sweringen (closing the discussion).—I have always been greatly disappointed in the treatment of tubal infections, whether puerperal or endometrial, through the vagina. In neither of the two cases I report in the paper could vaginal incision have accomplished anything except the evacuation of some pus. Of course, there are those cases in which that is the only thing you want to accomplish; the patients are *in extremis*, and you make vaginal puncture to get rid of some part of the sepsis, but certainly by the vagina you could not hope to correct the pathology that was present in these cases. In one case the uterus was adherent to the anterior pelvic wall so high up, that I doubt very much whether it could have been reached per vaginam.

I did not refer particularly to gonorrheal infections, and I did not have those in mind so much as I had septic infections which arose from the endomentrium. In the gonococcal infections the mucosa is more apt to be badly involved, and the inflammation, after its subsidence, leaves a scar which is apt to produce a stricture as in a gonococcal urethritis. That stricture may be at both ends of the tubes and a collection of pus in between, and in time, if allowed to remain, you have a hydrosalpinx which is a surgical case. I mean septic infection which is accompanied by an intense inflammation of the walls of the tubes and the whole pelvic structure suffers whereever the infecting agent comes in contact with it. That sort of inflammation gets well; if you do not take out the tube, you will never have to take it out. You might take out a tube which is hopelessly diseased and contains a collection of pus, if it is the original focus. You take that out just as you would in operating on a case of general peritonitis due to appendicitis. You take out the appendix if you can get it, and you open up the collection of pus between the bowels and drain it, but you do not expect any pus left there to remain permanently or any bowel that is involved in the inflammatory process will always be involved. It will get well, and the adhesions between loops of bowel will be done away with by the process of peristalsis. You get anatomatic massage in the belly that is performing its function all right. Peristalsis does it and the upright position in walking. So this particular paper had reference to the acute septic infections.

LOCAL ANESTHESIA IN OPERATIONS FOR HERNIA.[1]

BY
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The use of remedies applied locally for the production of anesthesia or analgesia is as old as surgery itself. History tells us that the ancient Egyptians, Chinese and Roman physicians, as well as the medicine men of Africa, knew of the artificial production of sleep and used such remedies as alcohol, mandragora root, hemlock, henbane, poppy, opium and cannabis indica to reduce the pain incident to surgical operations. It is related that in the middle ages instruments were heated or greased to diminish pain. Gold and silver instruments were constructed for the same purpose. The ancient Egyptians, according to Braun, were supposed to have produced local anesthesia by the fat or the dried skin of crocodiles and by the use of the so-called stone of Memphis, the latter being rubbed into the skin with vinegar. Religious and mystic ceremonies accompanied the use of these remedies and it is highly probable that the anesthesia was more suggestive than real.

Compression of the main nerve trunks of the extremities was a method employed in the earliest times to diminish the pain of amputations. This method was used in the sixteenth century and was highly recommended by Ambrose Pare. Compression of nerves was practised in many ways, from the simple method of encircling the limb with a tight constrictor to the use of a special appliance or apparatus.

In 1784, J. Moore, in England, invented an apparatus for the direct compression of nerves and was able to make a painless amputation of the leg after compressing the sciatic nerve for one and one-half hours. Hunter and Bell recommended the method. Although this method fell into disuse, it was revived and freely discussed, upon the introduction of the elastic bandage by von Esmarch.

The application of cold for anesthetic purposes was introduced by Thomas Bartholinus in the sixteentth century. John Hunter found that the ears of a rabbit became insensible to pain when they were previously subjected to cold. Baron Larrey, Moncheau

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Beaupre in the Napoleonic wars (at Eylau and in Russia), made the observation that amputation of limbs subjected to extreme cold was painless. The use of cold for anesthesia was not deliberately employed until Amot introduced it in 1848. (Richet in 1854, also Richardson in 1866). The use of cold is still of value, although greatly limited in its range of application. From time immemorial remedies which were known to produce sleep were also thought to have local anesthetic properties. This idea was prevalent even after the discovery of the modern anesthetics, such as ether and chloroform. Thus we read of the local application of cannabis indica, alcohol, aconite, hemlock, mandragora, opium, hyoscyamus, and many other remedies for the production of anesthesia. It is more than probable that anesthesia was seldom, if ever, produced by these remedies.

Many other interesting and peculiar remedies were employed in the past for the production of local anesthesia, such as the galvanic current; the use of escharotic pastes to surround the operative field and cataphoresis.

The invention of the hypodermic syringe by Alexander Wood in Edinburg in 1853, whereby remedies could be introduced below the surface of the skin, must be considered as one of the most important steps in the evolution of our modern method of local anesthesia. Morphine, opium and chloroform were injected directly into nerve trunks for their supposed local anesthetic action.

With the introduction of cocaine in 1884 the advance has been rapid and the method gradually made safe.

The history of modern local anesthesia is practically that of the evolution of cocaine and allied drugs. The earlier efforts at local anesthesia with cocaine were often attended by severe toxic symptoms and in some instances by death. A reduction in the amount of cocaine necessarily followed, until very small doses, even as low as one-tenth of 1 per cent., were employed. Much credit is due to Schleich of Berlin, who perfected the infiltration method of local anesthesia, using minute doses of cocaine in combination with morphine. With the introduction of synthetic preparations such as eucain, tropacocain, holocain, alypin, novocain and stovain, local anesthesia became less dangerous.

The discovery of adrenalin in 1901 (Takamine and Aldrich) was of the greatest importance for the advance of local anesthesia. Previous to the introduction of adrenalin, efforts to reduce the absorption of the anesthetic agent and at the same time intensify its action, were made by adding gelatine to the solutions, by the use of constrictors above the field of operation or by the application of cold. It was soon found that the addition of adrenalin in anesthetic solutions by its vasoconstrictor action not only reduced the rate of absorption but also intensified the anesthesia.

Clinical experience, as well as much experimental evidence, has shown that of the newer preparations, novocain is less irritating to the tissues, and less toxic than any other drug. When used alone novocain is fleeting in its action, but when used with adrenalin its action is prolonged. It can be safely used in large quantities and therefore makes good anesthesia more certain.

The history of local anesthesia would not be complete without mentioning the important pioneer work of Crile and Cushing in cocainization of nerves, or "nerve blocking." The study of the difference in sensibility of the various parts of the body, as worked out by Lennander, has had a most important bearing upon the progress of local anesthesia methods. Lennander demonstrated that both in health and in disease, the abdominal and pelvic viscera are devoid of sensation, but that the parietal peritoneum is very sensitive to pain. A knowledge of Lennander's work is therefore of the utmost value to the operator who desires to secure the best results with local anesthesia.

With novocain and adrenalin in local anesthesia, the following operations are reported in the literature as having been successfully performed. Operations upon the skull and brain; resections of the superior and inferior maxilla; excision of the tongue; thyroidectomy, excision of the larynx; resection of the esophagus; radical operation for tuberculous glands of the neck; rib resections; thoracotomy; gastrostomy; cecostomy; exploratory laparotomy; appendectomy; all forms of hernia; suprapubic prostatectomy; perineorrhaphy; colporrhaphy; vesicovaginal fistulæ; curettage; dilatation of cervix; the reduction of fractures and dislocations; anesthetizing the brachial plexus for operations on the arm; amputations of the lower extremity and many others of equal importance and magnitude.

The two methods of producing local anesthesia which experience has shown to be the most successful are (1) the method of infiltration after Schleich, and (2) the conduction method, or "leitungs anesthesia," as perfected by Braun. In the former, the anesthetic agent is injected directly into the field of operation, while in the latter the anesthetic solution is placed around the operation site and aims to block or interrupt all innervation to the part. In other words, not only around but also underneath.

In general, it may be said that success with either technic depends largely upon the amount of care exercised, the experience of the surgeon with the technic of the local anesthesia method, as well as his experience with the operation itself.

Operations to be successful under local anesthesia must be anatomically performed, with perfect hemostasis.

Failure to secure satisfactory anesthesia is not due so much to the shortcomings of the method as to the improper use of it.

The infiltration method of Schleich so successfully used in hernia operations of Bodine and others, is more complicated than the conduction method of Braun.

The conduction method is simple and gives an anesthesia over a large area. In Europe it has almost entirely supplanted the other forms of local anesthesia.

Local anesthesia in abdominal surgery finds its greatest application in hernia operations. By many surgeons it is now considered the anesthetic of choice for such operations. The use of local anesthesia for hernia operations is always indicated in the aged, or in the presence of severe organic diseases, such as cardiac lesions and diseases of the lungs, liver and kidneys. It is particularly indicated in strangulated hernia.

It is well known that only a small percentage of patients with hernia are operated, and that deaths from strangulation are not uncommon. In my experience the chief reason given by patients for not submitting to hernia operations has been the fear of a general anesthetic. Many patients have expressed themselves as feeling assured that the operation itself is curative and without danger, but do not care to risk anesthesia with ether or chloroform. Patients readily consent to hernia operations when informed that it can be done without pain and without a general anesthetic.

The disadvantage of local anesthesia is that of operating upon a conscious patient. This, however, is largely overcome by the use of preliminary hypodermic injections of morphine in combination with atropin or scopolamin.

Operations for inguinal hernia can be performed just as thoroughly under local anesthesia as with a general anesthesia. This is also true of umbilical hernia in patients who are not too obese.

The solutions of novocain and adrenalin employed range from 1/2 to 2 per cent. The 1/2 and the 1 per cent. solutions are most frequently used. The quantity of the solution to be employed varies with each operation. According to Braun, as much as 200 c.c. of a 1 per cent. solution has been used by Axhausen, although the average amount is only 50 to 60 c.c. The 1/2 per cent. solution which appears to be the standard solution is used by Braun and many others in quantities as high as 200 or 250 c.c. without the slightest toxic effect. The quantity of adrenalin added to the solution ranges from three to ten drops per ounce.

The preparation of the solution is simple. The novocain, adrenalin and distilled water in the desired amounts are placed in a flask, boiled for three minutes, it is then ready for use.

The syringe used should be of the Record type. My own preference is for the Record syringe of 10 c.c. capacity with a right-angled needle, the needle being about 2 1/2 inches long. The part to be operated upon is surrounded by a novocain barrier which is either rhomboid or diamond in outline. The superficial structures are first "blocked" by placing the solution directly under the skin. The deeper structures of muscle and fasciæ are blocked by introducing the needle into them, but two insertions of the needle are necessary when the barrier is diamond in outline: with the rhomboid outline about six punctures must be made. The introduction of the needle is rendered painless by infiltrating the skin with the Schleich method. The individual nerves, when encountered in the field of operation, should be anesthetized separately. The solution must also be deposited around the nerve tracts which supply the parts to be operated.

It is absolutely essential that fifteen to twenty minutes elapse from the completion of the injections to the beginning of the operation. Attempts to operate before the expiration of the amount of time will be met with failure. After the proper wait, the operation is begun and proceeds with the same ease as with a general anesthetic. Supplementary injections into the deeper structures after the skin has been incised may be used. With this method of local anesthesia I have performed thirty-six operations upon twenty-eight patients, eight of these being operated for double hernia. The operations were as follows:

No.	Date	Age, yrs.	Hospital	Sex	Duration of hernia	Duration of operation.	Type
1	Dec. 4, 1909	20	Infirmary Hospital	M.	Several years	No record	Right inguinal
2	Jan. 8, 1910	50	Infirmary	M.	Several years	No record	Left inguinal
3	Apr. 12, 1910	78	St. Vincents Hospital	F.	26 yrs.	25 min.	Left femoral
4	Mar. 27, 1911	58	St. Vincents	M.	12 yrs.	47 min.	Right inguinal
5	Apr. 18, 1911	68	St. Vincents	M.	1 yr.	2 hrs.	Bilateral direct inguinal and incisional
6	May 24, 1912	54	St. Vincents	F.	1 1/2 yrs.	28 min.	Left femoral
7	May 30, 1912	38	St. Vincents	M.	28 yrs.	30 min.	Indirect left inguinal
8	May 30, 1912	29	St. Vincents	M.	4 yrs.	25 min.	Right indirect inguinal
9	June 1, 1912	44	Patient's home	M.	Few months	20 min.	Right direct inguinal
10	June 16, 1912	56	St. Vincents	M.	2 yrs.	34 min.	Right direct inguinal
11	Feb. 1, 1913	50	St. Vincents	M.	1 week	30 min.	Right indirect inguinal
12	Feb. 3, 1913	38	St. Vincents	M.	3 weeks	28 min.	Right indirect inguinal
13	Mar. 6, 1913	57	Infirmary	M.	Several years	40 min.	Bilateral indirect inguinal
14	Apr. 9, 1913	51	St. Vincents	M.	8 yrs.	35 min.	Indirect right inguinal and femoral
15	Apr. 15, 1913	56	St. Vincents	M.	2 yrs.	20 min.	Right direct inguinal
16	Apr. 15, 1913	30	St. Vincents	M.	2 yrs.	18 min.	Indirect left inguinal
17	May 22, 1913	35	St. Vincents	M.	10 yrs.	38 min.	Direct right inguinal
18	June 9, 1913	42	St. Vincents	M.	15 yrs.	35 min.	Direct right inguinal
19	June 14, 1913	40	St. Vincents	F.	19 yrs.	38 min.	Direct left inguinal
20	June 30, 1913	68	St. Vincents	M.	3 yrs.	32 min.	Direct right inguinal
21	July 9, 1913	23	Infirmary	M.	4 yrs.	32 min.	Direct right inguinal
22	July 14, 1913	69	Infirmary	M.	24 yrs.	40 min.	Direct bilateral inguinal
23	Aug. 9, 1913	47	Infirmary	M.	10 yrs.	30 min.	Umbilical
24	Aug. 18, 1913	21	St. Vincents	M.	10 days	24 min.	Right indirect inguinal

Size	Method of operation	Pathology	Wound healing	Amt. Novacaine and adrenalin used	Remarks
Small	Bassini	Uncomplicated reducible hernia	Primary	60 c.c.	Good anesthesia
Large	Bassini	Simple uncomplicated hernia	Primary	60 c.c.	Good anesthesia
Medium	Bassini	Strangulated small loop dark-colored gut in sac	Primary	20 c.c.	Good anesthesia
Large	Bassini	Uncomplicated reducible hernia	Primary	60 c.c.	Supplemented by general anesthesia
Large	Bassini	Incisional hernia from suprapubic prostatectomy obese pat. atrophy of muscles	Primary	100 c.c.	Supplemented by general anesthesia
Medium size	Bassini-Kocher	Strangulated	Primary	60 c.c.	Good anesthesia
Medium	Bassini	Uncomplicated reducible hernia	Primary	60 c.c.	Good anesthesia
Medium	Bassini	Simple reducible hernia	Primary	60 c.c.	Good anesthesia
Small	Bassini Ferguson	Simple reducible hernia	Primary	120 c.c.	Good anesthesia
Large	Bassini Ferguson	Reducible hernia uncomplicated	Primary	60 c.c.	Good anesthesia
Small	Ferguson	Reducible hernia uncomplicated	Primary	60 c.c.	Good anesthesia
Small	Ferguson	Reducible hernia uncomplicated	Primary	60 c.c.	Good anesthesia
Medium	Bassini left Ferguson right	Sigmoid adherent to sac on left	Primary	120 c.c.	Good anesthesia
Medium	Ferguson	Simple hernia	Primary	105 c.c.	Good anesthesia
Large	Ferguson	Hernial sac very adherent. diff. dis.	Primary	120 c.c.	Good anesthesia
Small	Ferguson	Simple uncomplicated hernia	Primary	75 c.c.	Good anesthesia
Medium	Ferguson	Omental adhesion to sac	Primary	90 c.c.	Good anesthesia
Medium	Ferguson	Recurrant. 5 previous op. old Bassini	Primary	120 c.c.	Good anesthesia
Large	Ferguson	Simple hernia	Primary	120 c.c.	Good anesthesia
Large	Ferguson	Strangulated large amt. of small bowel	Primary	120 c.c.	Good anesthesia
Medium	Ferguson	Removed hernia from app. reducible hernia	Primary	120 c.c.	Good anesthesia
Medium	Ferguson	Reducible uncomplicated hernia	Primary	110 c.c.	Good anesthesia
Medium	Mayo	Omentum adherent to sac	Primary	105 c.c.	Good anesthesia
Medium	Ferguson	Reducible hernia	Primary	180 c.c.	Good anesthesia

No.	Date	Age, yrs.	Hospital	Sex	Duration of hernia	Duration of operation	Type
25	Aug. 20, 1913	30	St. Vincents	M.	2 yrs.	38 min.	Bilateral direct inguinal
26	Aug. 27, 1913	56	St. Vincents	M.	Left side 15 yrs. Right side 3 yrs.	45 min.	Bilateral indirect inguinal
27	Sept. 5. 1913	69	St. Vincents	M.	13 yrs.	40 min.	Left direct inguinal
28	Sept. 13, 1913	46	St. Vincents	M.	12 yrs.	35 min.	Right direct inguinal

28 operations for radical cure of inguinal hernia.
3 operations for strangulated inguinal hernia with radical cure.
1 operation for radical cure of femoral hernia.
2 operations for strangulated femoral hernia.
1 operation for incarcerated umbilical hernia.
1 operation for incisional hernia.
36 Total number of operations on twenty-eight patients.
Mortality 0 per cent.

In only two of the earlier operations was it necessary to finish the operation under a general anesthetic. This was due to inexperience

Size	Method of operation	Pathology	Wound healing	Amt. Novacaine and adrenalin used.	Remarks
Small	Ferguson	Strangulated hydrocele of cord	Primary	120 c.c.	Good anesthesia
Right large Left medium	Ferguson	Hydrocele right side	Primary	180 c.c.	Good anesthesia
Large	Ferguson	Strangulated sigmoid omentum and dark-colored gut in sac	Primary	165 c.c.	Good anesthesia
Large	Ferguson	Several loops small bowel	Primary	150 c.c.	Good anesthesia

with the method. The operations were uniformly painless, without nausea or vomiting and without the slightest toxic effect from the anesthetic solution. The sensation of the operation is described by the patients as that of a pulling or tugging on the parts. In a few instances some pain was complained of when working about the hernial sac or peritoneum. This can be overcome by a separate injection of the neck of the sac early in the operation. As the adrenalin acts as a hemostatic, there is some danger of a postoperative hematoma. It is, therefore, necessary to ligate all blood-vessels as soon as they are divided.

2050 FRANKLIN STREET.

DIAGNOSTIC HYSTEROTOMY.[1]

BY
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Medicine may be divided into two parts, therapy and diagnostics. All the other branches correlate to one or the other. So practical, fascinating and self-satisfying is therapy that the profession as a mass faces that way. It is only when we use our deeper minds, not alone through force of habit but stimulated by necessity, that we endeavor to make correct diagnoses, and I am speaking of diagnoses in the broadest sense. We are all born therapeutists. Few of us are born to make correct diagnoses. The tendency to be philosophical, to depend upon intuition and to skip essential points leads to opinions imperfectly based but personally gratifying. Any procedure, however novel or disturbing to the mind which enables greater accuracy, should be studied and perhaps accepted.

A great change has come over medicine. The interest the public, particularly the press, has shown makes an increased demand upon the practitioner for cleverness in diagnosis and enlargement for prognosis. The early diagnosis of incipient conditions, especially of the cancerous state, in which we ask the public to join, reacts as positively upon ourselves that the ability be ours.

Inspection of the interior of the uterus and judgment of its disease states have been accepted for time past as accomplished. The clinical symptoms of endometrial changes overlap and we often find a similar syndrome under diverse pathologies. Since Sims in 1865 introduced the sharp curet to the profession the interior of the uterus has been explored by means of it. Its contour, size, consistency of the lining, and the condition of the uterus itself can be and has been largely determined by the sense of touch as felt through this instrument. So much can be discovered by the intelligent, trained operator by means of it that a sense of satisfaction even now pervades the profession as to its findings. Particles of endometrium and granulations that have been removed by the curet may be sent to the laboratory and there sectioned. By the method just stated a diagnosis of the condition of the interior of the uterus may be made with great accuracy, and in such institutions as Johns Hopkins Hospital, the Mayo clinic and others of equal completeness, this will hold good, but surgery cannot all be done in these high-grade institutions. There are many excellent surgeons who have not at their command efficient laboratories and other aids which these places give. We have many small hospitals with little capital which provide no place to which the products of curettage may be sent for prompt determination.' A freezing microtome is out of the question with them. Sanatoria are springing up numerously. Most excellent work is done in many of them. Then, again, the surgeon is often called to distances to operate in homes. In all these instances prompt, accurate working diagnoses must be made on the spot, for reasons which are best appreciated by the patient as well as by the attending physician. Repeated anesthesia, particularly outside the hospital, greatly tends to disturb professional relations.

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

Then, the curet is a *dangerous* instrument. Punctures of the fundus are common and gouging out of considerable portions with damage to viscera is not unknown. Degeneration of the uterus itself, softening of its tissue and loss of a sense of touch in the neighborhood of the fundus deceiving the operator lead to this untoward event. Careful men have entered the abdominal cavity.

There is another danger which exists in conditions of malignancy. A firm curettage incident to the removal of granulations may not only open the lymphatics and vascular channels, but may also lead to auto infection of parts of the uterus not primarily invaded. If it be wrong to incise a malignancy of some other part of the body, why should not the same principle hold as to the interior of the uterus? The curet must be entrusted to the occasional operator and to the man with poor personal equation; therefore, our preachment should be such that they can be instructed and controlled, because we cannot prevent the use of this instrument by them.

The curet is *incomplete*. Any one who has carefully curetted a uterus which was about to be removed, and after removal split it, will see that he had left behind in a condition of morcellement and subject to infection much of the endometrium. Particularly incomplete is it in the fornices where the tubes enter the uterus. Many curetments fail to explore this region and lesions existing there may escape discovery.

The curet is *incompetent*. We leave not only considerable granulation tissue, but pedunculated polypi, and even decidual remains not infrequently defy this procedure. A noted New York gynecologist recently remarked to his class after an operation, "I have done a complete curettage." That night the patient aborted twins. He had not diagnosticated pregnancy. This summer at the Wertheim clinic, Dr. Wertheim's assistant did a vaginal hysterectomy on a woman with the following history: She had been delivered of a child at that institution. Two months after confinement she had considerable hemorrhage, was curetted, and the products of curettage sent to the laboratory and peculiar (?) bodies found. At the end of another few weeks she bled again and was again curetted. A week later she had a hemophthisis and in the blood from the lung the same peculiar (?) bodies were found. No diagnosis was made from them. As soon as she recovered completely, a hysterectomy was done. After removal, the uterus, which was not oversize nor changed in appearance, was split. On the posterior wall in the neighborhood of the right fornix was a slightly elevated crater about 1 1/2 centimeters in diameter, with rather a pulpy content—evidently a chorioepithelioma. Montgomery tells of one of his cases where after curettage had failed he did a diagnostic hysterotomy and found the uterus filled with grape-like masses. Dr. S. M. D. Clark had referred to him for radical operation a case diagnosed carcinoma from curetted scrapings. Laparotomy disclosed ectopic pregnancy and hysterotomy a normal endometrium.

.The true history of the curet and its use we do not find in our text-books and rarely in our journals, and the warning of McMurtry should never be forgotten.

With the constant demand for prompt and early diagnosis, with the necessity of finding and radically operating for precancerous conditions, the day seems past for long-drawn-out efforts at diagnosis after the fashion of the gastrologist. There should be, perhaps, a little more surgery and a little less diagnosis. This, I know, is heresy, but it may be good judgment in the minds of some, at least.

Exploratory hysterotomy, that is, hysterotomy for complete diagnosis, should seldom be attempted *per se*. All the ordinary methods of exploration should be resorted to before this is used, but there are times when during operation for other conditions (whether above or below the bone), the uterus attracts attention, and not from its symptomatology but from its appearance, it seems wise to inspect it thoroughly, then hysterotomy without previous exploration is correct. I have met cases where the uterus alone attracted attention—persistent hemorrhage, occasional leaks, indicative of some chronic pathology—where curettage had failed to establish a diagnosis, or where I had lost confidence in it and felt the necessity of exploration in order that sight and touch might make things more conclusive. In these conditions a vaginal section, the fundus brought down anteriorly, with hysterotomy is without danger and gives one confidence of a positive diagnosis.

The writer has found in some twenty-seven operations of this kind (six of which were by vagina and twenty-one by abdomen), thirteen different pathologies. He was led on the date of June 25, 1907, from the misadventure of removing a three-months' pregnancy under the diagnosis of soft myoma, to split suspicious uteri rather than unnecessarily unsex a woman.

The diagnosis of pregnancy is often impossible. There is no surgeon living who can surely diagnosticate this condition even with the uterus in his hands. Variations in the size, shape, color, mottling, intermittent contractions over the uterus, proceeding from the neighborhood of the tube, feeling, position of tubes, direction of entrance, size and consistency of them, and presence or absence of corpora lutea are as variable and inconstant as nature's symptomatology, which may be absent or incomplete. Each surgeon has met this dilemma. Carstens protests against exploratory hysterotomy saying, "there is too much operation and too little diagnosis," but we have cancer to fear and I have met beginning carcinoma of the fundus which very closely simulated pregnancy.

There is one important point in the technic of hysterotomy which should never be forgotton or considered lightly, and this is, closure of the uterine wound in the woman who may become pregnant. It should be carefully sutured so that there will be a minimum amount of scar tissue, or, rather, no scar tissue, and complete union in its entire length. The obstetrician in hysterotomy for pregnancy (Cesarean section) finds that with slow and careful closure of the uterine wound subsequent pregnancies occur without risk. If it is hurriedly or carelessly done and there be a gap and scar formation, the scar may bulge, particularly at the time of labor, and rupture ensue.

The history of hysterotomy appended is very meager, but interesting and instructive. Naturally, it was first used therapeutically, following the trend of general medical history. Only gradually did it become employed for the purpose of completing a diagnosis.

Memoranda on Hysterotomy in the Older Gynecological Literature, from Secheyron's Monograph.

The use of the term hysterotomy, very common in the seventies and eighties, but subsequently largely renounced, is too confusing to make practical use of at the present time. It could mean myomectomy or discission of the cervix for sterility, etc.

There is, however, not the slightest doubt that Pean, at least on a few occasions, actually performed a vaginal hysterotomy, in the modern American sense, for the removal of intrauterine polypi or fibroids. In one case he states plainly that he split the corpus bilaterally for this purpose. Ordinarily he used a snare (?). This was in 1885. It is also certain that he performed in 1886 an "*explorative vaginal hysterotomy*" (his own language) in a case of metritis with false membrane. He split the cervix bilaterally for its entire length, and was able to recognize a decidua-like state of the mucosa of the corpus, for which he used the curet and thermocautery.

Traite d'Hysterotomie et d'Hysterectomie par la Voie Vaginale; *Secheyron*, Paris, 1889.

The first 400 pages of this large monograph relate entirely to vaginal hysterotomy. The author makes no attempt to trace the history of the procedure save through case histories. It may be used for diagnosis or therapy. There are two divisions:

1. *Cervical Hysterotomy.*—This is simply discission of the cervix, a general resource for diagnosis and therapy of affections of the cervix, of special utility in plastic work after tears, etc., and for overcoming atresias. This section may be passed over as not pertinent to the subject.

2. *Hysterotomy of Cervix and Corpus—Hysterotomy Proper.*—This subject is a new one. The operation is useful as a simple diagnostic procedure, may be applied to the treatment of uterine deviations with dysmenorrhea, and sterility. It is also applicable for the removal of fibromas, especially the interstitial, in polypous inversion, in fibromata during pregnancy, and in cystic collections, abscesses, etc., within or near the uterus.

Manuel Complet de Gynecologie. Lutaud, 1900.

Hysterotomy for Fibromas.—By this term the author does not refer to myomectomy in the sense used by Kelly and others. He means an abdominal hysterotomy which consists of opening the uterus as in Cesarean section, and in extracting the tumor through the wound. Among those who have operated with success in this manner are Bouilly and Ricard. The latter he quotes from.

"After laparotomy, the uterus having been raised from the lesser pelvis and isolated with compresses, I make an incision along the median line. If the seat of the fibroma is known, the incision can be adapted to it, and when exposed it may or may not be necessary to open the uterine cavity in order to remove it. If the latter is opened before attacking the fibroma the lips of the incision are kept separated and the cavity wiped dry with aseptic compresses. Advantage is taken to curet the uterine cavity. Even if the fibroma can be removed without the necessity of opening the uterine cavity this latter step must always be taken in order to permit drainage of the uterus and cavity left by the myoma. Curettage finished, the internal orifice of the cervix is dilated, and a drain inserted which drains both cavities into the vagina. This done, the uterus is sutured, usually one plane sufficing."

The author believes this to be an operation of the future.

Suprapubic Hysterotomy as a Means of Diagnosis and Treatment of the Uterus. Russell, in Johns Hopkins Hospital Bulletin, 1906.

This paper consists almost wholly of thirty-two case reports of this operation, the first of the series having been performed in 1897. There is no mention of any earlier article on the subject. The operations were performed by the authors, Kelly, Cullen, Ramsey, Miller and Stokes.

The author refers briefly to the vaginal exploratory operation. The wall of the anterior cervix and uterus is split after the anterior culdesac has been separated from the bladder. Through the opening thus made the finger may explore the uterus. This resource is, however, unsatisfactory in a certain class of cases.

The first case shows how the author was led to select the suprapubic route. A young woman had been curetted repeatedly for hemorrhage. Examination showed that the genitalia were normal. Dilatation and curettage were tried and fragments of necrotic polypi brought away. There was no permanent improvement, so that an exploratory laparotomy was made, the uterus brought out and covered with gauze. It was then split anteriorly in the middle line from fundus almost to the internal os. Several polypi were found in the uterine cornua at the entrances of the tubes. After the mucous membrane was removed and the polypi curetted away, the musculature was sutured and the uterus dropped back.

The indications for this operation had been somewhat as follows: If, in the course of a laparotomy, a uterus shows a suspicious enlargement, or if there has been unexplainable hemorrhage, an incision is made antero-posteriorly through the fundus and in front half way to the cervix. The entire thickness of the wall is divided, exposing the cavity for a distance of two or more centimeters. The mucosa can then be inspected and the finger used for exploration.

The operation is especially serviceable in cases of polypoid change in the mucosa at the cornua, which are not accessible to the curet when used through the natural passages. When a uterine hemorrhage exists which resists all treatment and of which the cause is unknown, another indication is furnished by pedunculated myomata and small submucous fibroids which do not alter the contour of the uterus.

There is no analysis or even summing up of the thirty-two cases. In a number of instances the patients were suffering from severe local affections and the hysterotomy was done only as an accessory to one or more operations, including utero-suspension, appendectomy, anchoring of loose kidney, operation for hemorrhoids, myomectomy, removal of ligamentous cysts, rectification of malpositions, etc., etc. This is perhaps the reason the cases are not analyzed. There were no deaths, and since many cases of obstinate hemorrhage were cured the author is more than satisfied with the results of his operation.

Vaginal Hysterotomy—Schauta. Lehrbuch d Gynäkologie, 1907, pp. 430-31.

According to this author, by the term vaginal hysterotomy one understands the detachment of the anterior wall of the uterus from the vagina for the purpose of operative removal of tumors from the uterine wall. Under exploration of the uterine cavity we find mention only of dilatation and digital and instrumental investigation.

It, therefore, appears unlikely that the recent development in America of exploratory and therapeutic hysterotomy for intrauterine affections, either vaginal or abdominal, was recognized by the German school when this book was written.

(This reference is of interest because hardly any other author of a systematic treatise on gynecology of recent years makes any mention of hysterotomy or metrotomy at all.)

Operative Gynecology. Kelly (*not Kelly and Noble*). 1909, vol. ii. p. 368.

"Following the initiative of my associate, W. W. Russell, I have a number of times performed hysterotomy; that is to say, an incision dividing the fundus of the uterus in an antero-posterior direction so as to expose its entire mucosa to view, in cases for which it was necessary for other reasons to open the abdomen. In several instances I have been rewarded by finding small submucous fibroid tumors which had caused considerable hemorrhage and which had not been detected either in an examination or curettage from below.

The removal of the tumors, followed by closure of the uterus with interrupted catgut sutures, has been followed by complete relief.

Hysterotomy. Deaver, in Journal of American Medical Association, 1912; lix–xc.

While this article deals chiefly with Cesarean section, there are references to incision into the nonpregnant uterus. One case of incision into the womb is a case of toxemia of pregnancy and a similar one referred to in the practice of a colleague might be grouped under Cesarean section, but the duration of pregnancy is not stated, and there was clearly no prospect of expectation of saving the fetus.

In incising a uterus the prospect of finding an ovum is often present, as the operation would hardly be undertaken unless the uterus were enlarged. Thus the author mentions hysterotomy as a diagnostic resource in a question of soft, symmetrical myomatous uterus and pregnancy. The author would not operate unless morally certain that pregnancy was not present, yet would be prepared for the result should this chance be the case.

In December, 1911, he performed a hysterotomy of this sort. A diagnosis does not seem to have been made and laparotomy was chiefly exploratory. A tentative diagnosis of cyst of the left ovary had been made at one time. No menstruation for three months. Laparotomy showed a symmetrically enlarged uterus corresponding to three months' pregnancy. Some small subserous fibroids were removed. The uterus was then incised and a fetus found and removed.

In suspected cancer of the uterus, two cases, the author performed hysterotomy and found a polypoid state of the endometrium. He was able to curet intelligently. By the ordinary method repeated curettage often fails in these cases.

The author briefly describes his technic and states that the chief contraindication is infection of the uterus. In the discussion of this paper most of the members spoke chiefly of Cesarean section and had but little to say of hysterotomy of the other types.

Boldt believes in vaginal hysterotomy as a diagnostic procedure in suspected submucous polypi.

E. E. Montgomery, *loc. cit.* twelve years before had done a hysterotomy in a nongravid uterus of a young single woman. After *failure of curettage* he did a diagnostic hysterotomy at the fundus and found th *uterus filled with grape-like masses.* In this case he removed the entire womb. Two years later he incised another uterus and found pregnancy. This time he emptied the uterus through the incision. In a third case, while certain of pregnancy, he incised the fundus and found none.

Goldspohn does not believe in opening the abdomen in these cases. Vaginal hysterotomy should answer all requirements, unless it has become necessary to do laparotomy for some other indication.

C. S. Bacon and R. B. Hall seem to think it pernicious to teach hysterotomy as a diagnostic procedure, as the method of choice in placenta previa, etc. They protest against any endorsement of the procedure by the American Gynecological Society.

S. M. D. Clark spoke well of hysterotomy, which he credited apparently to Russell of Johns Hopkins, at least as far as the diagnosis of obscure cases of uterine hemorrhages is concerned. The author has found in this manner small submucous growths. One, a woman suffering from prolonged hemorrhage had been curetted in vain. Scrapings *pronounced carcinomatous;* referred to author for Wertheim's radical operation. Laparotomy revealed ectopic pregnancy; hysterotomy showed *normal endometrium.* The decidual cells brought away by the curet had been mistaken for cancer. (This case has already been cited in this paper.)

Cullen had recently seen a case of persistent hemorrhage of obscure character. Scrapings revealed no pathological state. He did not think hysterotomy indicated. But had the abdomen been already opened he would split the uterus under certain circumstances. Thus in one case where laparotomy was thought advisable for uterine tumor, he split the uterus and found the remains of an abortion. Hysterotomy is indicated in cases in which careful examination and curettage cannot be made, and the abdomen is already open.

Coe has recognized vaginal hysterotomy for some years as a valuable diagnostic procedure in select cases.

Deaver concluding mentioned the drawbacks of curettage, calling it a most dangerous procedure.

A résumé of cases met in our experience, together with lesions found, is as follows:

Early, symptomless pregnancy simulating soft myoma—two cases.

Cystic mole, curettage negative, two cases.

Decidual tumor pedunculated in fornix, curettage failing, three cases.

Incipient malignancy, two cases.

Hematometra following amputation of the cervix, one case.

Myomyxoma, three cases.

Fibromyoma, two cases.

Hyperplastic endometritis, recurrent, two cases.

Malformation of uterus, one case.

Degenerative metritis with persistent symptomatology, two cases.

Fibrosis uteri, five cases.

Adenomyoma, one case.

Curet trauma, one case.

To sum up: When is hysterotomy justifiable? still remains a question. I have grave doubts whether any one can answer this in pathological terms. One's personal pride in making a diagnosis without too much surgery should lead to a proper effort to obtain same through complete history, curettage, and perhaps the added opportunity of a manual examination of the uterus, but if by these means, particularly in chronic cases, one cannot be positive as to the contents of the uterus or of the condition of its substance, then in my opinion hysterotomy is not only justifiable but necessary.

280 MONTGOMERY STREET.

DISCUSSION.

DR. HUGO O. PANTZER, Indianapolis.—The greatest diagnostic precision possible before operating shall always be the ideal of the surgeon. To the extent to which this paper leans to this, I endorse this paper most heartily. I regret the doctor said that, at present, there are still many practitioners so conditioned that they cannot have pathological scrapings examined. I take it that this is no longer a tenable ground. The man who does not reach out for equipment and cooperation necessary to have pathological tissues examined, falls short of doing his full duty.

Hysterotomy is now an established and recognized means of diagnosis. I have in mind the case of a woman, eighty-two years of age, who had hemorrhage thirty years after menopause. I did a vaginal hysterectomy, assuming I had to deal with cancer of the body. Subsequently I found that a nonmalignant polyp hanging from the uterine ostium of one tube was the cause of the uterine disquietude and hemorrhages. While the patient made an uneventful recovery, death might have followed the operation. The additional risk entailed by an hysterectomy, as compared with hysterotomy, in single instance may eventuate in the death of the patient.

DR. JULIUS H. JACOBSON, Toledo, Ohio.—I wish to report a case for what it is worth in connection with this subject of hysterotomy. I believe this operation is one destined to have a place in our work, and I feel sure that in cases of submucous fibroma a diagnostic hysterotomy will oftentimes save a uterus that would otherwise be removed by complete hysterectomy.

A case that occurred in my practice within the last six months illustrates some of the points Dr. Pantzer has made. This patient, thirty years old, was an unmarried woman who had severe uterine hemorrhages. We resorted to curettage and removed what we thought was the hypertrophic form of endometritis. We were not satisfied with the findings, so deliberately made a laparotomy and opened the uterus through the hysterotomy incision. I passed my finger into the uterus and was unable to feel anything. The interior of the uterine cavity was smooth. No pathology of any kind could be determined with the finger. We neglected in this particular case, for some reason or other, to have a microscopic examination made of the uterine scrapings. In less than two months hemorrhage continued; I operated on the girl again and found advanced adenocarcinoma of the fundus of the uterus with involvement of the iliac glands. We did as complete an operation as possible.

This case illustrates you may put the finger on the interior of the uterus and not be able to determine the pathology present. It emphasizes the value of microscopic examinations of the uterine scrapings.

Dr. Roland E. Skeel, Cleveland, Ohio.—I believe the procedure advocated by Dr. Dickinson is valuable. I simply rise to make a protest against the statement made a number of times that removal of the uterus is unsexing the woman, also myomata are multiple instead of single and I wonder how much good is really done by myomectomy, multiple myomata being present, but the uterus not removed with the object of avoiding unsexing the woman. Unsexing means removal of the sexual organs, and I have never understood that the uterus was the essential sexual organ of a woman. The uterus, so far as bearing children is concerned, serves a useful purpose as a baby incubator; but that it has any other purpose, I am very doubtful. A study of comparative anatomy shows that nothing but oviparous animals carry a uterus for any sex purpose. Therefore, I protest against the idea that it is unsexing a woman to remove the uterus when in reality the ovaries are the essential sex organs in a woman, and not the uterus itself.

Dr. Maurice I. Rosenthal, Fort Wayne.—I have tried to indicate in this paper that all cases of cancer as they come for operation and late cancer and must be treated as advanced cancer. An operation of any kind for diagnostic purposes, which necessitates or involves the cutting of the cancerous tissue is dangerous. There is danger of infection from malignant disease. Unfortunately, the symptoms of malignant disease are late in manifesting themselves. Hemorrhage and foul-smelling discharge means breaking down tissue. When we have those symptoms, unfortunately, the case is already pretty well advanced. There are no early diagnostic signs of cancer.

I wish to report here a case of cancer of the uterus, in which we did a thorough curettage. Specimens were carefully examined, and a report of nonmalignancy made on the microscopic findings. The patient had a recurrence of the hemorrhage and a watery discharge within three or four weeks. A curettage was done again; her symptoms continued again in a week or two, and we resorted to hysterectomy. The clinical findings were those of carcinoma. I opened the uterus after removing it, and a professional friend of mine looked at it and said, "what did you remove that uterus for?" I replied, "because I think it is cancerous." It did not look as though it was cancerous. Nevertheless, that woman died within two years of general carcinoma. How much the curettage had to do with the general infection I do not know, but I suspect that I assisted materially in spreading the disease by my diagnostic curettage. As I have said, our great weakness in cancer is our lack of means for making a diagnosis.

Dr. James N. West, New York City.—I should like to call attention to one point relative to the diagnosis of conditions in the interior of the uterus. I consider the doctor's paper very valuable, in that it calls our attention to a loose diagnosis which is not infrequently made. I deprecate what I see to-day as a tendency to make an operative diagnosis, and I think it is common, since operations have become so easy, to defer diagnosis until operation is made. This is what I call a loose method of diagnosis, and I believe there is room for most of us for a more careful study of the cases beforehand, and the procedure to which I desire to call attention along this line is a thorough dilatation of the cervix and uterus by means of sea-tangle tents, so that the uterus can be easily explored without the necessity of a hysterotomy. I have done this repeatedly and have been rewarded by making the diagnosis by the use of the sense of touch in the interior of the uterus. This can be done in thirty-six hours. I wish to call attention to that point and emphasize its importance in diagnosis.

Dr. Hugo O. Pantzer, Indianapolis.—If I may be pardoned for adding to the remarks I have made, I would mention a point bearing on what Dr. Skeel has said. The easy decision of some operators to remove the uterus under similar conditions, when it is seemingly a useless organ, I cannot approve. I would maintain that the severance of nerves and vascular trunks which supply in common the uterus, the bladder, the rectum and the vagina, is not of indifferent effect upon the remaining organs. I would here cite the case of a woman, who, when first I saw her, had all her genitalia ablated three years before, for epilepsy. Although only twenty-seven years old, her vagina, bladder and rectum were atrophic, as by senility, and her attitude toward her husband and the male sex generally, was much like that of an aged woman.

Dr. Miles F. Porter, Fort Wayne.—I would like to second what Dr. Pantzer has said regarding the excuses that are sometimes offered for inefficient work. The hospital or the surgeon who is not equipped in every way to carry out all of the recognized diagnostic measures should get out of business.

I would like to say another thing regarding operation. If you or I or somebody else is asked to go over to Podunk or some other place to operate on a case of chronic obstruction of the bowel, or perhaps remove the uterus with a myoma, can you or can you not conscientiously do that? Is it giving your profession a fair chance?

Is it giving the woman a fair chance? Is it playing square with yourself when you go over there and do it for what purpose? To get the money that there is in it and to keep the other fellow from getting it. (Applause.) If I believe it is necessary for a patient to come to the hospital, and I say to them, I want you to come here, and if they say they will not do it, then my reply is, I have quit doing business on the judgment of the laity, and that should be the attitude of surgeons the world over.

Dr. Dickinson (closing).—I tried to so express myself that you would not feel I was endorsing this operation as an exclusive dogma. I am not. However, I do feel there are times when we operate with the belief that we have carcinoma to deal with and yet it is not. Let us take the case mentioned by Dr. Pantzer. Evidently from his preliminary remarks he submitted the scrapings to a competent pathologist and reports came back immediately from the laboratory saying the disease was carcinoma, and accordingly he goes ahead and operates and finds it is not cancer. He got everything a man ought to have, and he found it was not carcinoma. He removed the uterus; he put the woman to that little extra operation of removal. I feel it is to a certain degree unsexing a woman to remove the uterus at any time, because there is a certain sympathy between the uterus and ovaries, and most people I think believe, I may be wrongly informed, that the ovaries begin to degenerate and change, so that after a few years a woman is in the same condition she would be if she had both the uterus and ovaries removed.

What Dr. Rosenthal said about the diagnosis of carcinoma, etc., only applies after you have exhausted every other method. The clinical symptoms in the case he spoke of, such as a bad, offensive discharge and continued hemorrhages, would lead any one to become suspicious, but it is the early cases we are after. We are calling on the public to come early so as to enable us to make an early diagnosis. You are not going to make it of symptoms if you are suspicious and have lost confidence in the curet. If you are in doubt about the diagnosis, as well as doubtful about the report of the pathologist, I would suggest that you split the uterus and make sure for the woman's sake.

LACERATION OF THE CERVIX, A CAUSATIVE FACTOR IN SALPINGITIS.[1]

BY

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There is a type of salpingitis whose presence is not infrequently disclosed during an abdominal section performed for some pelvic lesion other than a tubal trouble.

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

The finding under such conditions of an unsuspected tubal pathology prompted me to a closer clinical scrutiny of any pelvic disease before operation in the hope that the operative and the clinical diagnosis might not be too much at variance.

The operation disclosing the existing salpingitis was usually undertaken either for an appendix lesion, a cystic condition of the ovary, a retrodisplacement of the uterus, or for a multiplicity of these pathological conditions. The disease of any of these organs usually presented clinical manifestations that gave little or no difficulty in arriving at a preoperative diagnosis. All seemed satisfactory from a clinical standpoint, excepting the failure to recognize the existing salpingitis. Here was a condition apparently severe enough to invite symptoms sufficiently pronounced to court a diagnosis, and yet this condition was overlooked. Upon what grounds can this oversight be explained?

It must be explained upon one basis, *i.e.*, that the other existing morbid conditions of the pelvic organs presented symptoms sufficiently severe to overshadow the symptoms of the salpingitis that was present. This gave an interesting aspect to this type of salpingitis, suggestive of the fact that the tubal trouble must be the result of a mild infection; that it must be of a chronic nature and possess a symptom-picture that has lost much of its intensity and characteristics. Furthermore, this type of salpingitis was not a serious menace to the health of the woman.

The pathological aspect of the tube as it presents itself during operation bears out this assumption. That the infection was of low type is evidenced by the inflammatory nature of the tube and the immediate structures. The tissues appear of a dull reddish hue and are edematous, presenting a distinctly inflammatory infiltration. The tubal structure proper is swollen, often showing irregular sacculations. Invariably the condition is bilateral, with the tubes quite free and often prolapsed. It is not unusual to find the ostium of the tube closed, transforming this type of simple salpingitis into a hydrosalpinx.

That the salpingitis is subacute and chronic in character can be convincingly inferred from the vagueness of its clinical manifestation. Usually nothing more than a "tired pain" in the back and a dull aching in the hips is the principal complaint of the patient. This pain is so constant that it has become a part of the woman's nature. Inasmuch as its degree of severity fluctuates but little, the pain is permitted to go on, the woman saying little and bearing her burden as only a woman can.

The disclosure of a vaginal examination does not prove definitely the existence of a salpingitis, because the examining finger cannot interpret correctly the pain that seems to pervade a hypersensitive pelvic viscera. The existence of a hydrosalpinx, when sufficiently large, can usually be diagnosticated by palpation without difficulty, whereas a tube that is slightly or not at all distended with fluid will present its difficulties.

The rather frequent finding of this tubal pathology during an abdominal section presented certain phases of interest. One phase is that of its etiological nature. Here an important factor for consideration was that the condition invariably manifested itself in a woman who had borne children. At no time has this type of salpingitis been observed by me while operating on a woman who had not borne children.

It must be assumed that a vagina which has been subjected to the abuses of childbirth possesses no longer the full protecting media it had before labor.

Microorganisms, such as the streptococcus, staphylococcus, and the bacterium coli commune, which are constantly found about the vulva, and which have difficulty in developing or surviving in a normal vagina, will no longer find, in a vagina whose physiological barriers have been weakened through parturition, that the inhibitory influences of the Döderlein bacillus are so extremely detrimental to their existence.

In a woman who has given birth to children the most frequent lesion that can be directly attributed to childbirth is a laceration of the cervix. It is a trauma whose importance has been not only too often disregarded but it has also been underestimated. True, if the tear is a superficial one, it will most likely heal completely in a short time. If, however, the laceration is a deep and perhaps an extensive one, it will not heal. Eversion of the traumatized lips of the cervix will take place, and a chronic inflammatory process with its sequelæ will become established.

When the inflammatory disintegration of the tissues of an ectopic cervix, with its lowered resisting tone, is considered, it can readily be comprehended how such a diseased cervix can through its rich lymphatic supply, invite an acute microbic inflammation whose tendency to chronicity may be a question of a very short time. A great deal depends upon the capacity of the tissues for resisting a microbic invasion, and this is happily influenced by the physiological congestion, both menstrual and sexual.

Inasmuch as the portals of a lacerated cervix through which the microorganisms can gain entry into the channels of transmission are constantly open, an infective process may continue as long as microorganisms are present in the vaginal secretion, and are being carried to the structures where the lymphatics go.

That lacerations of the cervix are the most common atria for infection of the tubes is evidenced by the frequency with which this pathology is encountered during operation. Not only is the infective material carried by the cervical lymphatics to the tubal structures, but it is also deposited into the cellular tissues of the broad ligament.

Another phase of interest presented by these cases was to note the influence of the infective material upon the tubal structures. It was found that in more than one-half the cases the ostium was totally occluded, presenting a typical hydrosalpinx.

The dilatation of the Fallopian tube was only moderate, comparing in size to the diameter of a lead pencil. The rest of the cases presented a tubal pathology that had the appearance of an uncomplicated salpingitis of a subacute nature.

Sacculations of irregular shape were found in a number of cases, both in the hydrosalpinx and the simple salpingitis. Anent the hydrosalpinx, the logical deduction must be made that the tubal infection was caused by microbes possessing a low degree of virulence, yet sufficiently toxic to set up a perimetritis on reaching the peritoneal cavity, thus bringing about a perimetric closure of the ostium. In the cases of simple salpingitis this degree of virulency evidently did not exist. The fact, however, must not be overlooked that a simple salpingitis might have been the sequel to a hydrosalpinx. This pathological evolution must be attributed to a lowered toxicity of the infective material and to the increased powers of restitution at some time during microbic activity.

This view is supported by the fact that when a lacerated cervix is subjected to plastic repair, some of the women who seemed sterile, after having given birth to a child, again became pregnant. It must be assumed that the plastic repair of the cervical tear inhibited the further absorption of toxic matter, thereby removing a morbid stimulus and permitting a partial recovery of the tube. It is not strange that nature should seek to open and keep open its avenues so essential to procreation. By observing these cases of sterility, where a plastic on the cervix seems to restore the woman to her normal powers of conception, the evidence becomes almost convincing that such a pathological condition, occlusion of the ostium, must have existed at the time of their sterility.

With much regret have I repeatedly witnessed, as a disinterested spectator, the removal of the tubes for a condition of hydrosalpinx that was accidently encountered during an operation, thus rendering the woman sterile. I have always felt that this is a pathological condition which should not be subjected to such drastic measures.

It is one of the few tubal infections where very frequently restoration will take place without sacrifice of these organs. The necessary surgical measure for relief consists in freeing the fimbriated end of the tube, turning back the mucosa and retaining it with a suture. Of equal importance, however, is the obliteration of the primary focus by plastic repair of the lacerated cervix. The source inviting microbic inflammation having been removed, infective material will no longer find routes of transmission to the tube. Freedom from these continued bacterial assaults will gradually permit the tube to return to a normal or an almost normal state, with the possibility that the patient may again become pregnant.

Delmar Building.

REPORT OF CASES.[1]

BY

ARTHUR T. JONES, M. D.,
Providence, R. I.

I. Case of solid tumor of parovarium evidently originating from the Wolffian body.

II. Case of large sarcoma of ovary. Great amount of fluid in abdominal cavity. Improvement in general condition since operation. Prognosis good for several years in this type of case.

III. Results three years after hysterectomy in case of sarcoma and carcinoma of the uterus.

Case I.—Mrs. X. White. Widow, forty-nine years old. Had one child twenty-three years ago. No other pregnancies. Menstruation regular, every twenty-eight days. Not painful. Duration four to five days. Amount moderate.

Present illness. One year ago fell upon floor in one of the department stores, following which she had prolapsus uteri for three months. Immediately following this she noticed her abdomen getting larger. For several months previously she had nausea and vomiting. Pressure upon the rectum and desire to defecate almost constantly, but was unable to accomplish the act, and at one time had impaction of the bowels. Complained of severe backache constantly, pain extending down both legs.

Examination shows the abdomen very much enlarged, a mass extending well above the umbilicus. Mass seems elastic and has the general feeling of a cystic growth. Bimanual examination shows a mass rather elastic to the examining fingers and filling the pelvic cavity. The cervix can be made out, but the mass covers the uterus so fully that it is impossible to palpate the uterus separately.

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

Tentative diagnosis: Probable large ovarian cyst.

Operation January 22, 1913. Upon opening the abdomen, a tumor the size of adult head was found, filling the pelvis and abdominal cavity, extending higher on the right side. The vessels over its surface were very much dilated. The tumor was found to be intraligamentary arising from the left side and intimately connected with the uterus. One loop of intestine was adherent to it for a distance of 8 or 9 inches. Peritoneum of broad ligament cut and tumor shelled out in part. Supravaginal hysterectomy was done, as it was impossible to free the tumor from the uterus. Round ligament ends were sewed to the cervical stump, and peritoneum closed over this. Closure of abdominal wound in layers by the usual method.

Upon incising the tumor, which still had all the appearances of a cystic growth, it was found to be a solid tumor.

The pathological report is as follows:

January 22, 1913.

Specimen of uterus and appendages.—The specimen is a uterus with adnexa removed by supravaginal hysterectomy. The left broad ligament contains a large solid tumor mass which comprises the bulk of the specimen. This tumor is a solid, elastic mass measuring 25×18×9 cm. and weighs 3175 grams (7 pounds). The free surface is reddish-pink with deeply injected and dilated veins. On median longitudinal section the cut surface is generally smooth, pearly white in color, and shows numerous larger and smaller distinct fibrous whorls. One area of the cut surface is of finer meshwork-like structure and is markedly pink in color. Scattered throughout the tumor there are many larger and smaller islands of smooth, flat, fleshy tissue, of pale pink color. As the knife passes through the substance of the tumor there are encountered areas of increased resistance with a distinct "grating" feel, but there is nothing present to suggest true ossification. The left oviduct measures 21 cm. Left ovary 5×1.5 cm. Right oviduct 13 cm. Right ovary 5×2.8 cm. The uterus from fundus to point of amputation measures in the canal 6 cm. At the level of the cornua the breadth of the canal is 2.5 cm. The uterine wall averages 2 cm. in thickness and the endometrium 4 millimeters.

Microscopic Examination.—Sections cut from many different areas present a widely varying histological picture. The main bulk of the tumor appears to consist of relatively dense connective tissue in which there is considerable variation as to the number and size of the component cells. Associated with this tissue as a frame work there appears in various areas unstriped muscle, cartilage cells, and in some instances cells that are epithelial in type. All of these elements show little, if any, purposeful arrangement or distribution.

In one section, however, there is a marked tendency to formation of a structure suggestive of a rudimentary kidney. Here appears the suggestion of primitive glomeruli associated with columns of cells that are epithelial in type. That these columns are an attempt at tubular formation is seen where they appear in cross-section when there is often a quite definite lumen surrounded by cells that are distinctly epithelial in character. In this area also the blood-vessels are larger than elsewhere, present more definite form and a more perfect and regular endothelial lining.

Unstriped muscle is more or less widely distributed in nearly every section examined. The cartilage cells appear in larger and smaller groups and are less often observed. In some fields the connective tissue is loose and wavy and at times appears almost myxomatous.

This is a neoplasm that is very complex in structure. Different portions present areas in which the histological picture observed alone would permit an interpretation that would not be justifiable considering other areas and the tumor as a whole. Tumors of the broad ligament usually originate from the paroöphoron or parovarium, in either instance being resultant to awakened or continued activity in those portions of the Wolffian body that ordinarily atrophy or remain dormant. The tumor now in question is considered as resultant to such activity of embryonal tissue. The picture of primitive kidney suggests the possibility of still active cell elements of the pronephros which embryologically appears before the mesonephros, the Wolffian body, as being a possible origin of the neoplasm.

A neoplasm classified as hypernephroma occurs not infrequently in all parts of the urogenital tract, and one might pertinently ask if the neoplasm submitted could not be classified as such. The structure and component cells are *not* those of hypernephroma and the lesion does not concur with the hypernephromas that I have personally examined of adrenal, renal, testicle, ovary, and broad ligament origin. It is difficult to classify such a tumor as that now examined. It consists of a conglomeration of embryonal tissue and it would seem wise to classify it, for want of better terminology, a neoplasm of the broad ligament, embryonal in type.

(Signed) HAROLD G. PALMER.

CASE II.—Mrs. X. White. Married. Fifty years old. Had one child twenty-nine years ago and three miscarriages, the last one twenty-five years ago. Menstruation up to the time of menopause was always irregular, painful at times. Duration five days. Amount moderate.

About fifteen months ago was examined by a doctor, whom she consulted for a vaginal hemorrhage, she having had no menstruation previously for two years. It was discovered at this examination that there was a pelvic tumor present, evidently a fibroid, and no operation advised.

One year ago she had fistula *in ano*, which was operated upon, and following operation, for some months she had feeling of pressure upon the rectum.

For the past three months she has suffered from pressure symptoms, sense of heaviness and falling down, soreness through abdomen, shortness of breath, and has noticed that the abdomen has been getting steadily larger. The patient is a large, well-developed woman, very well nourished and no apparent loss of weight.

Examination shows the abdomen prominent, mass felt in median line size of an orange. Mass seems freely movable. Another mass or portion of tumor can be felt extending upward on the left side. The outlines of the whole tumor are rather indefinite. Bimanually, the cervix is small and a large irregular fibroid feeling mass apparently connected with the uterus can be made out. Through the abdominal wall, the feeling is that of the presence of a cystic growth associated with fibroids.

Tentative Diagnosis.—Uterine fibroma with probable cystic growth.

Operation February 1, 1913. Celiotomy. Incision in the median line. Upon opening the abdomen, a large quantity of straw-colored free fluid was found, and a tumor the size of an infant's head, hard and fibrous in feeling, originating from the left ovary and adherent to left broad ligament. Pelvic portion of sigmoid seemed thickened but no definite mass in it. Epiploicæ of sigmoid much inflamed and enlarged. Right ovary size of a large English walnut and papillomatous looking as if becoming involved in malignant process.

Gall-bladder palpated and found normal, but at the foramen of Winslow was a glandular mass, size of a walnut. Both appendages with the tumor were removed. The uterus was considerably enlarged and contained a small fibroid growth, but was not removed.

The abdomen was closed in layers in the usual manner and patient made an uninterrupted recovery.

The diagnosis at time of operation was sarcoma of the left ovary with probable sarcoma of the right ovary, with evident metastases, and the prognosis given was unfavorable.

The pathological report is as follows:

February 1, 1913.

Specimen from ovaries.—The specimen for examination is a tumor of the left ovary. It is a solid tumor mass 9×11×13 cm. On mesial section the mass is solid throughout, generally smooth and homogeneous, and of pale yellow color. The right ovary measures 20×30 mm. and presents an evacuated cyst 12 mm. in diameter. Its walls are smooth and shining.

Microscopic Examination. Left Ovary.—Sections present a solid mass of proliferating cells that have small, deeply staining, vesicular nuclei and very scanty cytoplasm. These cells are intimately associated with wavy bands of fibrous connective tissue which vary much in density in different areas in the sections. The neoplasm is well supplied with capillary blood channels formed from cells of the neoplasm. There is no normal tissue.

Pathological Diagnosis. Fibrosarcoma. Right Ovary.—(Section cut to include cyst wall.) The ovarian stroma is increased in density, but not otherwise remarkable. The cyst wall, which is irregular in outline because of numerous finger-like inward projections of stroma, is lined with tall columnar epithelial cells that have large, central, well-staining nuclei and generous cytoplasm. These cells are usually present in a single layer but at times are reduplicated. The lesion is benign.

[Signed] HAROLD G. PALMER.

The patient's condition has steadily improved since operation, and at the present time she is apparently in perfect health. There is no evidence of free fluid in the abdomen. Color is good. Appetite excellent, and no shortness of breath.

CASE III.—I wish to report the results at this time on a case of carcinoma and sarcoma in the same uterus, which was presented at the twenty-third Annual Meeting of this Association held at Syracuse, 1910.

This case had a hysterectomy done May 18, 1910. Examination August 21, 1913, three years following her operation, shows the patient to be in excellent general health. Locally, there is no evidence of any recurrence of the malignant condition. This case had a complete hysterectomy, but not the extensive Wertheim operation, and although three years may be too short a time to feel secure of permanent cure, still it is interesting to know that three years following operation for such an extensive involvement, with two different types of cancer, the patient is apparently in perfect health.

81 ELM GROVE AVENUE.

THE USE OF IODINE IN ABDOMINAL SURGERY.[1]

BY

LOUIS FRANK, M. D.,

Professor of Abdominal and Pelvic Surgery, Med. Dep't., University of Louisville, Louisville, Ky.

To the carbolic spray of Lister, in the present day of aseptic surgery, is indeed a far-cry considered from the standpoint of the development of surgical methods. Even in the author's experience of twenty-five years there have been many striking changes. Early in our surgical career everything in the healing of operative wounds, even the patient's life, depended (?) upon the liberal use of bichloride of mercury; and the writer distinctly recalls more occasions than one where this drug in solution of 1:5000 was used for irrigating the peritoneal cavity! Needless to say the mortality was very high. The use of bichloride of mercury, however, for the preparation of the field of operation is yet in vogue in many hospitals.

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

The general method of preparing the abdomen until within very recent times was to use a liberal amount of soap and water and a scrubbing brush, following this with ether, then alcohol, and a generous application of mercuric bichloride in solution. Until about a year ago our own method for the past ten years was, after a thorough shaving, to have the abdomen prepared by washing with soap and water followed by alcohol; the application of a soft-soap poultice which was left on from two to four hours; then again washing with water followed by alcohol, after which a sterile gauze dressing was applied and the patient sent to the operating-room for the final pre-operative step in cleansing. This consisted in again washing the field with soap and water, using gauze sponges, followed by a thorough cleansing with alcohol well rubbed in. After such preparation, even in emergency cases in which only that much preparation designated as "pre-operative" was used—such as intestinal obstruction, acute appendicitis, acute gall-bladder disease, Cesarean section, in fact any abdominal operation—there was always primary healing in clean cases. The greatest objections to the method were that the table frequently became sloppy, the patient's clothing became wet, and four or five minutes being required to complete the technic there was some delay in proceeding with the operative work. There are, of course, other objections which are self-evident.

In the last few years, since the work of Cannaday, a member of this association, and particularly since the classical paper of Grossich which appeared in 1908, surgeons generally in abdominal as well as other work have come gradually to the use of iodine in the preparation of the operative field. The value of iodine as an antiseptic is undoubted, as numerous experiments in the laboratory and its practical use have shown, and likewise its usefulness in surgery is unquestioned. In emergency surgery it is believed to be the best of all antiseptics, possessing a value which is inestimable. Its use has recently been advised intraperitoneally, and it is to this phase of the subject that we desire to particularly address our remarks.

My attention was first called to the intraperitoneal application of iodine by a paper by Prof. William O. Roberts, of Louisville, and in the discussion which followed I stated that I believed it was a dangerous drug. It seemed to me that practically the same condition confronted us as in the early days of antiseptic surgery in the use of bichloride of mercury, and notwithstanding the clinical reports of recoveries following its application, I could not believe it was harmless when employed within the abdomen. To determine this latter point, we have made some fifty experiments upon dogs, and others are being prosecuted. In the execution of this work there were a number of points to be determined.

(1) Is the tincture of iodine toxic when introduced into the peritoneal cavity?

(2) Is iodine itself toxic when applied to the peritoneal cavity?

(3) Does iodine or its tincture have a harmful effect upon the peritoneal endothelium?

(4) If the effect is harmful, how long must the contact with iodine continue to produce harmful effects?

(5) Is the effect of tincture of iodine and of iodine the same in the infected as in the normal peritoneum?

Further points to be determined are: (a) is alcohol detrimental to the peritoneum, and (b) is iodine in aqueous solution toxic or harmful in the same dosage as the alcoholic solution?

We have practically determined all these points except the effect of the tincture of iodine and iodine in the pathological abdomen; and, as these experiments are still in progress, we hope shortly to demonstrate this feature from a laboratory standpoint.

I will not burden you with reading the protocols of all our experiments as these will be published in the transactions, but will give a summary of our work and our conclusions after a careful study of the effect of tincture of iodine upon the peritoneum.

We have found that tincture of iodine injected into the peritoneal cavity in quantities greater than 0.125 per cent. of the weight of the animal invariably produced death; that death occurred either from shock or from the toxic effect of the iodine, and in the latter case the animal lived from two to three days. Pure alcohol used in like quantities did not produce death, though Lugol's solution acted the same as iodine in tincture, and in some instances more quickly. We conclude, then, that iodine is distinctly toxic when introduced in solution into the normal peritoneal cavity.

It will be remembered that the U. S. P. tincture of iodine contains about 7 per cent. of pure iodine. The doses given in these experiments amounted to about 0.0875 gm. per kilo of weight, which would correspond to the employment of 100 c.c. of the Tr. iodine in the average individual weighing 150 or 160 pounds. We mention the quantity because it is stated by those who are using iodine within the peritoneum that it may be poured into the cavity a pint at a time. Crisler and Johnson say they have sometimes used as much as a gallon of a 33 1/3 per cent. dilution of the officinal tincture with alcohol.

While Lugol's solution contains less iodine than the officinal tincture, it is apparently more toxic than the tincture or pure iodine. We think this is due to the greater saturation in Lugol's solution than in the tincture. Pure iodine in quantity equal to the amount present in the tincture and which was sufficient to destroy the life of the animals, did not produce death. Here, however, the iodine is not in soluble form, and we had only its local irritating effects. In quantities less than 1 c.c. per kilo of weight, death was not produced, and in these experiments we found only the local action of the iodine.

This drug is very irritating to the normal peritoneum producing destruction of the endothelium with an invariable and constant adhesive peritonitis. This was demonstrated by experiments on eleven dogs, the amount of the tincture used varying from 1/3 c.c. to 3/4 c.c. per kilo of weight. In large quantities, from 2 to 5 c.c. per kilo of weight, death ensued almost immediately from shock, and in every instance the tissues were dehydrated, presenting the appearance of having been exposed to intense heat; in other words, they seemed to be charred.

In the largest non-lethal quantities, that is 1.25 c.c. per kilo of weight, we found evidences of tremendous irritation, there being in every instance a great extravasation of serosanguineous fluid. The blood-vessels, mesentery, omentum and intestinal tract were markedly congested and distended with blood.

It is difficult to determine whether the adhesive peritonitis where small amounts of the tincture were used was due to the iodine or the alcohol which held it in solution or to both. In three dogs in which alcohol in quantities of 1.25 c.c. per kilo of weight were injected, there were well-formed adhesions at the end of two days with extravasation of serum. In all three the abdominal cavity was filled with serosanguineous fluid.

Pure iodine in quantity equal to the amount contained in 1.25 c.c. of the tincture did not produce death in experimental animals, though the result to the peritoneum was deleterious. In each instance where it was used there were found postmortem dense adhesions with some of the iodine unabsorbed and easily recognizable in the walled-off areas.

Lugol's solution in nontoxic quantities caused tremendous extravasation of serosanguineous fluid, staining the tissues yellow. There was also present after its use fine adhesions between the omentum and the intestines, the blood-vessels of the mesentery and the omentum and parietal peritoneum being markedly congested.

In another series of experiments, after preparation of the abdomen of the dog as is ordinarily done preceding operations upon human beings, the intestines were brought outside, left in contact with the prepared and painted areas of the abdomen for periods of three to five minutes protected from the air with saline saturated sterile gauze pads. They were then carefully returned to the abdomen and the incision sutured, all the work being done under the strictest aseptic precautions. As controls for these experiments, the abdomen was prepared the same as in the previous series and was opened in similar manner, but after making the skin incision and before opening the cavity the iodine was covered; in other words, gauze saturated with normal saline solution was placed about the incision in such manner as to absolutely preclude the possibility of the iodine coming in contact with any intraperitoneal structure. The intestines were then lifted out, permitted to lie on this warm sterile gauze which covered the abdomen and the prepared field for a period of five minutes under similar conditions as above, then returned to the abdomen under similar precautions, and the wound sutured. The protective gauze was allowed to remain in place until we were ready to close the skin incision.

The differences were most marked. In each instance where the intestines had been in contact with tincture of iodine, adhesions were present between the loops thus exposed and other viscera within the cavity, these adhesions involving the entire portion of the bowel which had been in contact with iodine. In the control cases, however, where the intestine had been protected from contact with the iodine for the same length of time, with the same amount and character of handling, there was in no instance a single adhesion present.

In preparing the abdomen of all the dogs operated upon, we followed as nearly as possible the same method as used in our operative work with such slight variation as would be unavoidable in operating upon animals. In the last series of experiments mentioned, there was omission of one detail which in our own work we always observe; that is, the operative area was unprotected in the five experiments necessary to determine the effect of contact of viscera with the prepared field. Our method in brief is as follows: The patient's abdomen is shaved in the ordinary manner twenty-four hours before the operation, or if preparation be necessary within as short a period as twelve or fourteen hours before the operation, the shaving is done dry. The field of operation is washed with benzine followed by alcohol, and painted with 3 1/2 per cent. tincture of iodine; that is, the officinal tincture diluted with an equal quantity of absolute alcohol. After this has been permitted to dry, a sterile dressing is placed over the field, and the painting with iodine in like strength and protective dressing repeated early in the morning on the day of operation. After the patient is placed upon the operating-table and the sterile gauze removed, the field is once more painted with iodine in similar strength. Emergency cases are taken into the operating-room at once, the skin is either shaved dry or after being moistened with alcohol, then washed with benzine followed by alcohol and painted with pure tincture of iodine instead of the dilution.

The methods of preparation in our experiments, to be of any value in determining the effect of iodine, must correspond in every detail to that which we use in operative cases, and such having been the case we are forced to conclude that the effect in actual work would be similar to that obtained experimentally.

Notwithstanding our own opinions and some reported experiences, together with the results of our experimental work, we find that clinical results seem to differ from those which we have obtained experimentally. Thus we find, in the *Southern Medical Journal* for March, 1913, that Crisler and Johnson, of Memphis, Tennessee, report having for several years used iodine applied directly to the peritoneum. They employ a mixture of iodine tincture and alcohol, leaving out the iodide of potassium which the official tincture contains, the strength being 33 1/3 and 50 per cent. This solution is utilized for irrigating the peritoneal cavity, large quantities being used as will be noted by the following quotation from their report:

"What we most wish to bring before you is the fact that first, we are using the above mentioned 'half-and-half' in all cases of peritoneal infection; whether it be localized from an unruptured gangrenous appendix or other source, or whether the peritoneum is wholly infected, it makes no difference. We simply 'put out the fire' with this mixture and disregard infection thereafter. If we have a ruptured gall-bladder, for instance, as soon as this is discovered at the operation and before the incision is extended further, we literally pour a quart of this mixture into the abdomen and thoroughly sift it into all of the recesses. We do not fear the use of too much of the mixture; our only fear is that some pocket or interspace between the coils of intestines or elsewhere might escape us. If the case is already one of acute, general, fulminating peritonitis, we are even more liberal with the flushing out and washing out process with 'half-and-half' mixture. If in our judgment a quart will do, that is all that is used, though we have sometimes used as much as a gallon. This applies equally to any other infection whether it be a ruptured appendix with its consequent peritonitis, local or general, or a gunshot wound, or a ruptured bladder, or any other infection from the pelvic organs, or a perforated ulcer, or what not."

These authors state that the peritoneum is always irrigated with iodine solution proportionately to the extent of the infection, and that it has enabled them to feel perfectly contented as to the outcome of any case of peritonitis or of peritoneal infection, provided the treatment can be used before the patient is actually dying from the disease. They believe their completed statistics will show a mortality even in diffuse peritonitis of less than 2 per cent.

There seems to be a vast difference in the local effect of tincture of iodine in the infected and normal peritoneum, and as already stated we now have in progress further experiments to determine this difference and if possible the reasons therefor.

From our work experimentally and from our clinical observations with iodine in the preparation of the field for abdominal operations, we would conclude, That though Tr. iodine is effective as a means of sterilizing the skin it has its disadvantages:

That should the intestines come in contact with the iodine, adhesions will undoubtedly take place in the area thus exposed, due to the action of the iodine as an irritant to the peritoneum;

That when Tr. iodine is used as a means of preparing the field, the utmost care should be taken to avoid such contact by protecting the field beyond the abdominal incision by means of moist pads securely fixed in place;

That under no circumstances should iodine or its tincture be poured into the peritoneal cavity;

In the normal peritoneal cavity iodine in alcoholic or aqueous solution is in sufficient quantity distinctly toxic.

400 ATHERTON BUILDING

DISCUSSION ON THE PAPERS OF DRS. REDER, JONES AND FRANK.

DR. ROBERT T. MORRIS, New York City.—In regard to Dr. Jones' second case, I think we must keep in mind the fact that in some of the desperate cases of recurring malignant disease, Coley's serum is of value. Even though the percentage is not large, it is nevertheless definite, and being definite must be kept in mind.

I had one case of adenocarcinoma of the ovary which recurred almost immediately; it became very large, the tumor reaching almost to the navel, but now has disappeared completely under the use of Coley's mixed toxins. We must keep that in mind.

Dr. Frank's paper is timely at this moment. I do not know why it is so difficult to impress the profession with the idea that bacteria which are doing most damage are not in the pus or fluid that is free in the peritoneal cavity. They are chiefly in the tissues, and the pus itself may be good nutritious albuminous fluid; if you can get the patient to absorb a whole lot of such abdominal pus, she will be fatter and better for it. (Laughter.)

As to the use of iodinei n these cases. When the surgeon first began to use iodine freely, I was working on rabbits at the time, and found it was convenient to avoid shaving the rabbit. By applying iodine to the skin I could work rapidly and do what experimental work was in order. Everyone of these rabbits was found to have firm strong peritoneal adhesion of the bowel at the line of incision later. We now know that the use of iodine freely in this way at the time of making the incision is injurious. Then I noted quite a deal of local irritative peritonitis, not infective, in cases in which iodine was employed upon the skin before going into the abdomen of patients, and immediately devised the plan of removing all free iodine with alcohol carefully before cutting the skin. If we use iodine for skin sterilizing purposes, it is one of the best resources we have at the present time, but we must remove it with alcohol after it has been upon the skin for two or three minutes. After removing all free iodine, we may go through an area with our knives without danger of carrying it to the peritoneum.

In regard to the toxic feature. When we were all using iodoform, and when everybody could recognize the surgeon on the street by the odor he carried about with him, the doctor required neither badge nor button for identification. In those days we occasionally had an "unaccountable death" from the use of iodoform gauze in the peritoneal cavity. We knew certain patients had an idiosyncrasy against iodoform, and we now know that idiosyncrasy corresponds to anaphylaxis, or a better term is allergy, and quite a number of patients are allergic to the influence of iodine. Patients who are allergic to the influence of iodine may sometimes be killed by a few grains as surely as if you were to fire a bullet through their hearts. Of course, the proportion of such patients is small, but if it is your brother or a member of your family who is allergic to iodine, you would not care to have iodoform used in that particular peritoneal cavity. In the second place, it is unnecessary in the peritoneal cavity and that is the most important of all. We must remember that we depend upon hyperleukocytosis for meeting bacteria in the peritoneal cavity. We may use antiseptics but not germicides. All germicides are injurious. All germicides injure the plasm of body cells quite as definitely as they injure the protoplasm of bacteria. Organic cells are composed of protoplasm. The cells of your patient are as much living organisms as are the bacteria, and whatever destroys the cell protoplasm of a bacterium will at least injure the cell protoplasm of the patient. Certain antiseptics, which are not germicides, boracic acid, benzoic acid chinosol and a number of other antiseptics do not injure the protoplasm, but will inhibit the development of bacteria. The beef trust showed us that by immersing meat in a 1/4 per cent. solution of benzoic acid it would then keep much longer. A mild antiseptic will prevent or inhibit the development of bacteria We do not need germicides. Do not use any germicide whatever in the peritoneal cavity, as it is dangerous. It took the profession some three or four years before it began to realize that as a whole, and it will be about seven years before we will all be familiar with the fact. Let us begin now—some of us! Do not use germicides in the peritoneal cavity. Use antiseptics then occasionally, but antiseptics which are not germicide.

Dr. James E. King, Buffalo.—I think Dr. Frank has proven experimentally what some of use have proven to our own satisfaction clinically.

There is one point in connection with the use of iodine that in my experience has been extremely interesting and illuminating, and that is in regard to the use of iodine catgut. Ever since iodine catgut has come into vogue I have been a routine user and believer in it, but I had an experience a short time ago which shook my faith in it as an advisable ligature for intraabdominal work. I had the misfortune to open the abdomen a second time a few days after the primary operation, and I was perfectly surprised to see along the line of suture of the peritoneum that in two places the gut had become adherent from a large knot and loop of catgut, and that adhesion was due to free iodine in the suture and causing irritation of the peritoneal covering. The advice Dr. Frank gives in regard to covering the abdominal wall after the use of iodine I thoroughly believe in. This precaution I have taken. On one occasion I returned to the abdomen and found it quite discolored as the result of contact with the iodine on the abdominal wall, and whether or not I got adhesions in that case I have not been fortunate enough to learn.

Those who visited the clinic of Franz in Berlin were perhaps rather surprised, as was I, to find that he has discarded practically all preparation of the abdomen previous to laparotomy. His preparation consists of simply a bath the day before and at the time of operation—cleaning the abdomen with alcohol, I believe we are on the crest of a tidal wave of iodine, and I believe Dr. Morris has very well said we are coming to realize its limitations, and while it has a place, its free use and its use without good judgment is going to bring disaster.

Dr. J. H. Carstens, Detroit.—In reference to Dr. Reder's paper, I will say that we have virtually settled the question more than thirty years ago, but I think it is a good thing to bring up this matter once in a while because younger practitioners will forget the serious conditions that may sometimes result from a lacerated cervix.

The cases reported by Dr. Jones are peculiar and very unusual. We all run across them now and then, and it takes considerable experience to manage these cases and in some instance to make a diagnosis.

Dr. Frank has done such valuable work experimentally that any paper from him we are always glad to listen to. If there is anything I have trouble with it is the use of iodine. When I go to some new hospital or any hospital for that matter to operate, where I do not operate very often, I find the house physician prepares the patient, and the first thing I know he has applied iodine all over the abdomen. When I find they do that I talk to them very sharply, and they do not forget it. But if I talk to them in my sweet, oleaginous way they will soon forget it. If they put on too much I make them take it off with a little ammonia. Personally, I just wash the skin with simple soap and water, followed by alcohol, and I can show the collaterals, by having as few deaths from surgical work as anybody. Everyone seems to be more or less of a faddist in the use of iodine. Everything is iodine, iodine. What is the result? I find that there follows its use a lot of trouble, such as postoperative vomiting, adhesions, and obstruction of the bowels. So iodine is a dangerous thing in my opinion.

There is one point with reference to sewing up the abdomen, and that is, I do not sew up the skin; I fasten it with plaster. The skin holds nothing. If the fascia is good, everything holds. If a patient should go away and the abdomen opens up, a skin suture will not hold. I plaster it over with a little plaster, and I have a beautiful scarless wound, if the case is clean and aseptic. I could never see the object of using iodine ligatures and chromicized ligatures, and formaldehyde or any other kind of ligatures. What I want is a sterile ligature that will absorb quickly. Chemicalized sutures may act as dead material, that may cause irritation in two or three months. Dr. Morris has shown that tissues are firm in fifteen or sixteen days, and a little stronger ligature without any chemical will do just as well, and it is just as good as your chemically prepared ligatures. I can see one use for iodine. If I were a general surgeon and had a lot of accident cases, with dirty fingers and lacerated wounds, I could see how iodine might disinfect the parts where you cannot wash them very well, but it certainly is not good in ABDOMINAL SURGERY.

DR. FRANK D. GRAY, Jersey City, N. J.—It certainly requires some temerity to stand up after some of the last remarks and defend the use of iodine. But speaking as one who has done some surgery for a good many years before iodine came into vogue, and who has gone through the iodine period up to the present time, and remembering my results formerly and those at the present time, I must say I do not like the abuse of iodine more than I do the abuse of anything else. It is a rather curious phenomenon of the world that the pendulum swings back and forth, and it is quite evident from some of the remarks to-day that the pendulum has started to swing back from iodine. I think the trouble with iodine is, as I have remarked, the abuse of it. I would not say use less iodine or wash it off after you have used it. I should be inclined, on the other hand, to suggest that many of us do not use iodine at the proper time for skin sterilization. Two or three minutes' contact with iodine does not sterilize the operative field. I had an unfortunate mishap two years ago when operating on a case of double inguinal hernia. I prepared both fields at the same time just prior to my operation. I operated one after the other. There was no reason why there should have been any infection on either side; it was a clean operation; the same technic used; the same instruments; the same suture material; the same ligature material, and all that. The left side, which I operated first was infected. The right side, which I operated secondarily was not infected. The only way I can work that out was that the iodine had had time to produce some effect on one side and not sufficient time on the other. Since then I have iodine applied several hours in advance of the operation in elective cases and then apply it again upon the operating table. Where I cannot have the preliminary preparation of iodine, I have come to use gasoline to cleanse the surface, and right there is the crux of the matter of getting an iodine dermatitis. So many operators wash off the skin surface with water and apply iodine later, and are likely to get dermatitis. Iodine, water and skin are not congenial, but if the surface is prepared by dry shaving and iodine applied, or the surface prepared by gasoline and iodine applied, one will not get a dermatitis.

As to the possibility of damaging the peritoneal surface by contact of the iodine, there is no trouble about that. If you use the simple precaution of applying towels to the edge of the skin incision by the Moynihan clamps, you will get no contact with iodine at all. I think we have little cause to fear intraabdominal infection in our clean cases anyway. It is the abdominal wall infection that bothers us. It is the skin infection, the stitch abscesses, and sometimes the deeper wall abscesses which are the result of that. The suggestion of Dr. Carstens to plaster the skin is a good one. We can accomplish the same thing by resorting to the Michel clamps picking up the outer layers and not passing the sutures through the skin into the subcutaneous tissues.

Dr. Jones (closing the discussion on his part).—I will simply say, the first case was interesting to me from a pathological standpoint and from the infrequency with which we find solid tumors of the parovarium. Most of these tumors are of a cystic nature, and it is rare to find a solid growth.

Another point is the advisability of operating whenever we find a tumor. We still find plenty of physicians who when they find tumors say, Oh, let it go and see what happens. A tumor of this type is prone to become malignant.

The second case I reported also illustrates the advisability of operation, and I want to impress upon the general practitioner the advisability of operation when he detects the presence of a tumor.

This case was one in which we suspected a fibroid. It was allowed to go on for more than a year and upon operation we found it to be a sarcoma. I believe in these cases the earlier the operation the better it is for the patient.

Dr. Frank (closing the discussion).—Some of the points which have been brought out in the discussion are mentioned in my paper, which I did not take the time to read in full. Dr. Morris struck the keynote of the whole business regarding the intraperitoneal use of tincture of iodine when he says: *There is no necessity for it.* We are going through the same proposition with tincture of iodine that we did with bichloride of mercury. It brings up the question, in my mind, Why did men turn their attention so quickly to the use of iodine preparation? Was it because they were dissatisfied with their results by the old methods of preparation. A good many of us have been seeing wound suppuration very infrequently, others may have seen it more frequently. Was it for this reason they sought better methods of skin sterilization? It certainly was not on this account that we began the use of iodine. We tried it out, believing it was an additional good method and also for the purpose of comparison. Our method of preparation of the field with iodine is similar to that which Dr. Gray describes, first using gasoline or benzine to wash the skin, getting out all fat. We make our application of iodine twelve hours before operation, and see that no water comes in contact with the skin for some hours previous to the time set for the application. The skin is washed with benzine, followed by alcohol, and a 3 per cent. solution is painted over the field, a sterile gauze pad is applied and the next morning this is repeated, and finally in the operating room the skin is painted again with a 3 per cent. solution. The entire field is protected after the incision by moist pads fixed to the wound margin. We have found this absolutely necessary in abdominal work. In our experiments we studied the results with and without it to see what the effect of contact of the painted iodine with the intestine would be, whether it would be injurious or not. The results speak for themselves. With the old method of preparation we washed the field with soap and water and alcohol. Where the washing was done on the table, we had a sloppy table and this is not the best thing for the patient.

We have in emergency cases used absolute alcohol alone. It must be used sufficiently thoroughly to get the skin clean. I think in the hands of the general run of the profession, particularly those who have not had thorough training, we have a distinct advantage in the use of tincture of iodine as a means of skin preparation previous to operation. I have never used iodine gut. We use for all intraperitoneal work, except intestinal, the smallest size chromic gut compatible with safety, and for intestinal work we use fine silk or fine Pagenstecher linen. For closure of the abdominal wound we use chromic catgut but not of large size, never larger than No. 1. We have no catgut in our operating room larger than No. 2. Plain catgut used for the control of the blood-vessels within the peritoneal cavity would not be advisable under all circumstances, as I think there is some danger of its digestion and early absorption, and a probable secondary hemorrhage.

CANCER OF THE UTERUS AND FIBROID TUMORS FROM A CLINICAL STANDPOINT.[1]

BY

EDWARD J. ILL, M. D.,
Newark, N. J.

It seems to me that I owe you an apology for bringing this subject before you. My paper is only a continuation of the discussion of Doctor Hall's paper of a year ago. I owe you the proof of my last year's assertion.

My remarks on this subject will be short, since the subject does not permit of lengthy argument. I trust, however, the paper will be freely discussed. In doing so I will ask you to give me facts and personal experiences, not impressions; nor is hearsay evidence of any value. I am giving you my personal experience, always of more value to ourself than the experience of others.

For years I have been under certain impressions which came from casual observation and not from actual figures. I began of late to get anxious if such impressions were founded on facts as corroborated by actual clinical data or whether I would have to recant. If it was the latter, my apologies are due to many for my errors.

I am therefore simply presenting to you the facts as they appear in my case-books, written up by myself and by many who have assisted me during the past eighteen years. I trust the records are as correct as such records can be kept. We are all well aware how our profession swings from one extreme to another. Any physician of prominence who can plausibly put before us some notions, no matter how fallacious, will surely find a large following irrespective of one's own experience and common sense.

Let me remind you of the indiscriminate removal of the ovaries for neurotic disease; the unwarranted removal of acute pus tubes;

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

the Apostoli treatment of fibroid tumors and its baneful outcome. We are now in the throes of the indiscriminate curettages, frequently a harmful procedure, and the unwarranted removal of the appendix and fibromyomatous tumors.

When it was suggested that fibroids could or would eventually change into malignant growths or cause malignancy in other parts of the uterus, the onslaught on the innocent tumors received a new impetus. Any woman can be scared into an operation by suggesting the possibility of malignancy.

The high mortality of the operation for fibroids early in the history of abdominal surgery deterred many from operating.

At this time, however, when the operation has become a very safe procedure, safer than ovariotomy for neoplasms, many cases are operated on that present no subjective symptoms and in a vast majority of cases never will. Thus in my records I find series of fifty-six to fifty-eight and eighty-four successive operations without a death. A peculiar fact has been elicited by the perusal of my records for eighteen years, that not a single death occurred in private house operations, nor any in the small country hospitals; sixty-seven cases have thus been operated on.

In a perusal of the autopsy records of hospitals, variously situated, it was shown that from 4 to 8 per cent. of all women over thirty have fibroid tumors. In other words, these neoplasms are exceedingly common. I have operated on 443 cases. There was not a single case among them that presented malignancy. Nor is there a single record of any patient who has returned with secondary malignant disease.

These are my personal experiences, not those of my colleagues in the same hospital service nor my assistants.

The vast majority of these cases were sent to the operating room from my own office and were so-called private patients. It was thus that many have remained under close observation and the result of such an experience is more valuable than the records of the perambulating ones.

Cases with distinct subjective symptoms or such objective symptoms as would presumably lead to severe complications were selected for operation. Nevertheless, there is no record of any fibroid having undergone malignancy.

It appears from my office case-book that there were recorded during this time 2600 cases of fibroids of which 443 were operated on, being about 17 per cent. Some may have been and likely have been operated on elsewhere. I do not think there were many since

So many have remained under observation for years undergoing regular measurements and recorded examination. I have not heard of a single one that has become malignant.

During the same time there were 580 cases of carcinoma of the uterus, body and cervix, and one case of sarcoma of the body of the uterus recorded in my office case-book. Of these, 175 underwent some form of operation.

Of these operable cases, five contained from two to several small fibroids and two contained two small nonmalignant muco-polypi. Among the five cases, four were carcinoma and one had presumably sarcoma of the anterior wall. I say presumably because there was some doubt in the pathologist's mind and the case is of such recent origin that a recurrence has not yet taken place. This woman had several small fibroids in the posterior wall but came for symptoms referable to a beginning sarcoma. More than twenty years ago I operated on her for a retroflexed uterus by the Leopold-Czerny fixation and the sarcoma developed in the tissue underlying the fixation.

We have thus 2.8 per cent. of all cancer cases operated on containing fibroids, while the average of all women over thirty having uterus fibroids is from 4 to 8 per cent.; or fewer women with carcinoma of the uterus have fibroids than those without fibroids.

It is, therefore, my opinion that we have no moral right to place before our patients the possibility of these growths becoming malignant and thus scare them into an uncalled for operation.

It is my firm belief that these tumors never or very rarely undergo malignant change. Under any circumstances the change is not frequent enough to call for an operation as a prevention.

I think I am borne out in this by the opinion of even those who report malignant degeneration.

Even an expert operator, whose percentage of death is not more than three or four, has no right to suggest the operation when possible future malignant degeneration constitutes the only indication.

1002 Broad Street.

UTERINE FIBROMYOMATA OF THE LOWER UTERINE SEGMENT.[1]

BY
JAMES N. WEST, M. D.,
Professor of Diseases of Women at the New York Post-Graduate Medical School and Hospital.

(With Three Illustrations.)

The well-known difficulties of performing hysterectomy in cases where the true pelvis is well filled with fibroids have resulted in a mortality rate which is always quoted as being high. This has led the writer to present this short paper in the hope that it may offer a suggestion which may some times lead to simplification of the operation and a consequent lessening of the dangers.

The proportion of cases in which tumors growing from the lower segment more or less block the pelvis is given as about 5 per cent.

As soon as the tumor or tumors reach sufficient size to impinge upon the pelvic walls pressure conditions develop which manifest themselves by more or less serious symptoms.

The author's experience is that such tumors develop more frequently posteriorly than anteriorly or laterally

In case of the posterior development the body of the uterus is pressed upward and forward so that the cervix is forced against the pelvic arch catching the urethra between cervix and arch so firmly as to gradually interfere with the power of the bladder to empty itself, until finally the act of urination becomes impossible. This was the condition in all three of the cases herewith reported.

Other more or less serious complications may occur from pressure on the rectum, ureters or the vagina.

If the tumor develops very low it may form an absolute bar to labor; and pregnancy is not infrequent in uteri with fibroids in the lower segment.

Leaving out of the question, then, the propriety or wisdom of operating upon all fibromyomata when they have reached a distinctly appreciable size, those cases where the tumors are developing very low in the pelvis call for active interference, usually hysterectomy

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

Naturally in operating the first question to be decided is the route of the attack. This will be largely a matter of personal equation of the operator, some preferring to do the work whenever possible by the vaginal route and others by the abdominal.

The writer has had the pleasure of seeing Dührssen, of Germany, remove very large tumors which were chiefly abdominal, by the vagina.

He disregards the size of the vagina and in nullipara, as well as multipara, begins his operation by boldly incising the perineum, vagina and levator ani and stretching the outlet to its fullest capacity, then separates the uterus from its anterior and posterior attachments and bisects it, dragging down the uterus and tumor by powerful traction, he removes all by morcellement. This method can undoubtedly be well applied when the tumor is of moderate size and lies low in the pelvis, but the writer deems it unwise and inexpedient, if the tumor is large and occupies not only the true pelvis but extends well up into the abdomen. It also has the great disadvantage of not offering a convenient and safe control of abdominal complications which so frequently are present.

The ideal route for operation is that which brings the operator most directly and conveniently to the greatest bulk of the tumor and allows him the best opportunity to deal with complications. This, in the case of large tumors, even where they fill the pelvis quite well, will be the abdominal route.

Nothing is more characteristic of the ordinary fibroids than the ease with which they may be shelled out from their beds by division of their capsules and traction upon them. It is this character which suggested to the author the performance of a preliminary myomectomy upon the tumor occupying the pelvis. The tumor in the true pelvis is the one which complicates the operation and displaces the pelvic structures.

The plan of procedure is to open the abdomen and expose the tumor or drag it out of the opening as far as possible. In the kind of cases referred to, it will be found impossible to deliver all of the tumor, it being held firmly down and the pelvis more or less filled by it. A careful survey is made and a point is selected where the peritoneum and capsule of the tumor may be readily divided without injury to any important structure or division of any large blood-vessels. The tumor is seized at a given point, freed of capsule, and firmly drawn upward while it is being shelled out from its bed. This can be done very quickly and with little or no loss of blood. After the true pelvis has been freed of the growth or growths in this way it is surprising to see how quickly the anatomical field assumes normal relations. Ureters, bladder and rectum sink and retract immediately into their normal situations and the hysterectomy may proceed as in any ordinary case where the tumors are not from the lower segment. It is also surprising to find that sometimes the myomectomy alone will suffice and the sexual organs may be preserved for a patient, as illustrated in two of the following cases, which would not be true if one used the vagina as a route and began the operation upon the uterus by bisecting it.

Those tumors which, growing from the lower segment, become submucous and are pushed into the vagina, as fibromyomatous polypi, may be easily dealt with from the vagina. The author has had two cases recently of tumors of this character of such size as to press upon the urethra to a degree that made urination impossible, the inability to pass water forming an urgent indication for operation and forcing patients otherwise unwilling to have operation to consent to it. Both of these patients refused to allow hysterectomy to be done, which was advocated on account of the presence of other fibroids in the uterus and both were completely relieved of their symptoms by the myomectomy and curettage. Notwithstanding this, the writer still believes their uteri should have been removed.

The author's observation has been that more large polypi occur in women who have borne children than in the nulliparous, and that more of the subperitoneal tumors of the lower segment occur in nulliparous than in parous women.

Among the cases under discussion three have been chosen as presenting features of especial interest and as being more or less typical of classes of cases.

In relating these cases only the important points and chief features will be mentioned.

Case I.—An Italian woman, æt. forty-eight years, seen in consultation with Dr. A. Caturiani, October 10, 1907—Multipara. Menstruation for last two years profuse and irregular. Has been suffering for a few weeks from fever and severe pain in the left lower quadrant of the abdomen and pelvis. During this time she has had a gradually increasing difficulty in passing the urine until the last two days she has been totally unable to void it, and the doctor passed the catheter with great difficulty. Past history negative.

Physical Examination.—Heart and lungs negative. A hard irregular intra-abdominal and pelvic mass can be felt in the left iliac region. Vaginal examination reveals a dense mass occupying the hollow of the sacrum and pressing the cervix forward and upward. The finger can be inserted in the vagina with some difficulty between the mass and the pubes. The mass feels to be continuous with the one above and all to be fixed immovably in the pelvis.

Diagnosis.—A tentative diagnosis was made of malignant disease involving the uterus and other pelvic organs, but with the reservation that the diagnosis was sufficiently doubtful to justify an exploratory abdominal incision.

Operation, October 13, 1907. Through a median abdominal incision a dense irregular mass running up toward the left iliac region was found and in attempting to break up adhesions a considerable quantity of pus was encountered. As we felt that we were probably dealing with a malignant process, the pus cavity was drained through the incision and the wound was closed except for the drainage point. The patient was then placed in the lithotomy position for the purpose of obtaining a specimen of the growth which filled the pelvis and impinged far down upon the posterior vaginal wall. Upon incising the vagina over the mass the dense glistening fibers of the mass showed it to be a fibroid. It was removed forthwith by morcellement and the cavity packed with washed iodoform gauze.

This patient made an uneventful recovery.

September 7, 1913, her husband reported to me that she was in excellent health.

Case II.—An unmarried woman, æt. twenty-eight years, entered the Post-Graduate Hospital February 13, 1906. Menstruation regular but rather profuse. Had suffered moderate pain in the lumbosacral region for about two years, but considered herself very well until recently, when she began to have difficulty in passing urine. Now is totally unable to void urine and can only be relieved by catheter. Past history negative. Heart and lungs negative.

Examination of abdomen shows rounded masses resembling fibroids between pubes and umbilicus. Vaginal examination shows a large rounded dense mass filling the culdesac and pressing the cervix upward and forward firmly against the pubic arch and continuous with masses above.

Diagnosis.—Uterine fibromyomata with a large fibroid from the posterior pars intermedia of the cervix causing pressure against the urethra and retention of urine.

Operation February 14, 1906. An incision was made in the median line from the umbilicus to the pubes. In opening the peritoneum at a point three inches above the pubes the bladder was incised for a distance of 1/2 inch, this was immediately closed with two layers of catgut. The peritoneum was then incised and the mass liberated and drawn out toward the pubes by forcible traction. The true pelvis was so blocked by the lower part of the growth as to make operation quite difficult. A convenient point of peritoneum over the pelvic tumor was selected and incised. After incision through its capsule this tumor was easily shelled out, when the anatomical relations became much simplified and a supravaginal hysterectomy was easily performed after the usual method. This case made an uneventful recovery.

Case III.—Mrs. N. R., æt. forty years. Multipara. Was admitted to the Post-Graduate Hospital October 31, 1912. Patient was five months pregnant and complained of no especial discomfort except that recently she had a gradually increasing difficulty in passing the urine and an uncomfortable feeling of pressure in the pelvis. Five days ago she had ceased to be able to pass the urine and had to be catheterized. The attendant being no longer able to pass the catheter she was hurried into the hospital. Past history negative.

General physical examination negative. Bimanual examination

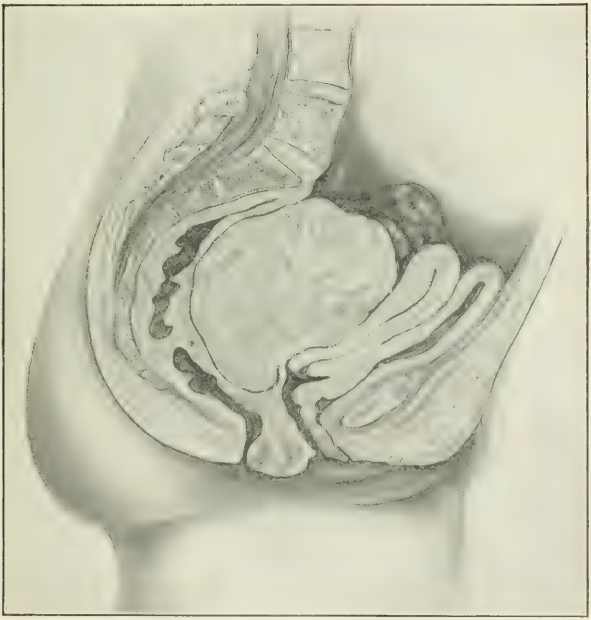

Fig. 1.—Fibroma of pars intermedia displacing pelvic organs and completely obstructing the urethra by pressure. Preliminary myomectomy followed by hysterectomy. Recovery.

showed a five months pregnant uterus lifted high up by a dense fibroid tumor occupying the culdesac and compressing the urethra firmly between it and the pubic arch.

Operation November 1, 1912. A median abdominal incision was made and notwithstanding that it was recognized that the bladder must be much displaced upward and an attempt to incise the peritoneum at a point sufficiently high to avoid it was made. An incision was made into the bladder. This was immediately closed with a double layer of catgut. The peritoneum was incised and the pregnant uterus was delivered through the wound by the hand. A large fibroid arising from the lower segment was seen filling the posterior part of the pelvis. This was apparently the only tumor present. Incision of the peritoneum and capsule over a convenient point of the tumor was made and the tumor shelled out. The wall of the uterus was so thinned at one point that membranes presented. The opening was enlarged from below upward by incision and the fetus membranes and placenta were removed and the uterus curetted lightly through the wound. The wound was closed as in Cesarean section and the abdominal wound closed without drainage. Except for a leakage of urine through the abdominal wound for a few days, the patient made an uneventful recovery and was out of bed on the fifteenth day.

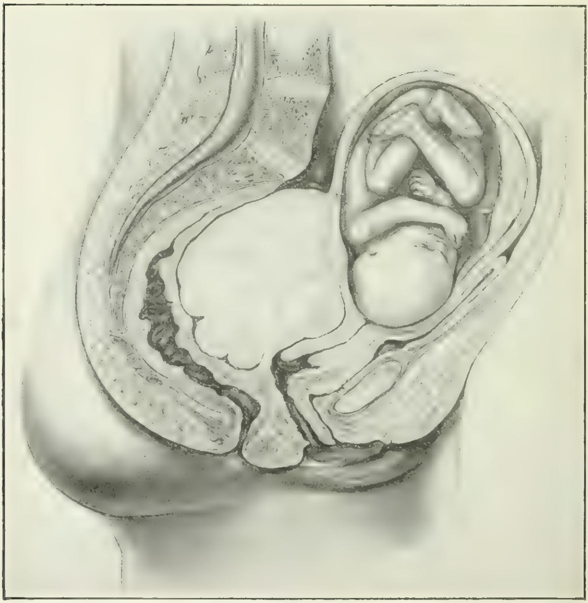

Fig. 2.—Five months pregnant uterus with fibromyoma from pars intermedia pressing uterus upward and forward and completely blocking urethra by pressure. Myomectomy and myotomy. Recovery without loss of any organ.

The points of interest and instruction in these cases are so numerous that I shall call attention only to the following.

(1) That cases of fibroid tumors of the lower uterine segment occur with moderate frequency where operation is an immediate and urgent necessity on account of pressure upon the urethra.

(2) That cases occur where fibroids in the lower segment complicated by inflammatory conditions closely resemble malignancy, and that such cases should have the benefit of an exploratory incision.

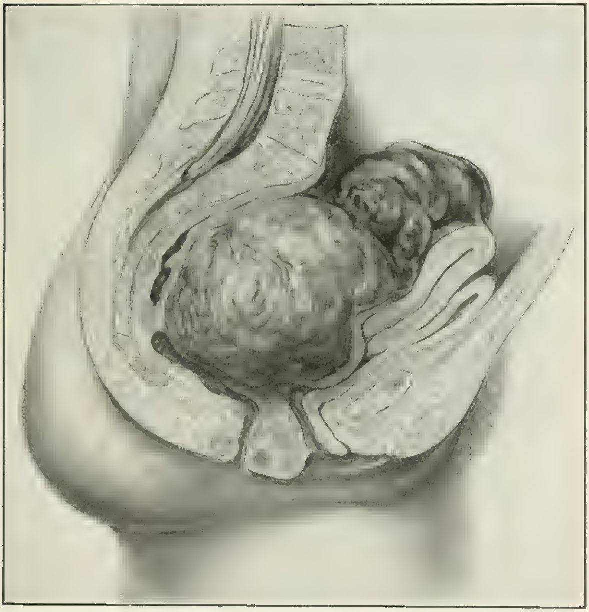

Fig. 3.—Fibroma of the pars intermedia developing posteriorly. Complete blocking of urethra from pressure. Pyosalpinx of left side. Drainage of pyosalpinx through abdominal wound; removal of tumor through the vagina by morcellation. In perfect health eleven years later.

(3) That a preliminary myomectomy may often allow structures to assume a more normal anatomical relation and thus simplify operation and reduce the danger.

71 West Forty-ninth Street.

DISCUSSION ON THE PAPERS OF DRS. ILL AND WEST.

Dr. Herman E. Hayd, Buffalo.—This is a very interesting subject to us because we have all had a reasonably large experience in dealing with these cases. The subject is interesting because fibroid tumors are so common and the mortality associated with surgical intervention is so low, practically nil. It is surprising how these tumors, as the Doctor has said, grow. We have one uterus in which the whole structure is simply one intramural mass of fibroid tissue; another uterus which is filled with small tumors the size of a pea up to perhaps the size of two fists or larger. We know how they can grow, sometimes in the top and how they often grow in the lower segment, and how they often extend into the broad ligament, and they may extend so much transversely as to wedge themselves into the pelvis and then it is with the greatest difficulty we can deliver them sufficiently to do the necessary surgery. Perhaps the suggestion as given us here by Dr. West may be a valuable one in connection with some of these cases—that is to do a myomectomy first, but it seems to me, in order to do his operation you will get into as much difficulty as you would have had in delivering and clamping and ablating the fibrous uterus. The difficulties in connection with these cases, as the doctor has shown us are great, first of all, because they are so firmly impacted in the pelvis, and secondly, are difficult on account of the resistance offered in pulling them up. We get hold of these tumors with a large tenaculum, they can only be pulled up a little distance and then they fall back again, in fact it is difficult to get them up far enough to put clamps on the broad ligaments.

Sometimes I have had the greatest difficulty in putting a clamp on, but after you get one clamp on the ligament it is easy to slip another along side of it and then with a knife you can cut between them and thus set free the one side of the broad ligament and then you are able to deliver the tumor sufficiently to make the rest of the operation comparatively easy. One can then push a forceps between the folds of the peritoneum after first lifting the anterior flap and catch the uterine artery and cut off the cervix with the Kelly spud and then the other side can quickly be taken care of. I have been very much impressed with this method of procedure. I never try any more to separate the peritoneum posteriorly from the uterus. First of all, it is too hard to get it off. It tears and breaks away, and secondly, it is unnecessary. You can get as much peritoneal covering as you require from the anterior flap to cover the stump satisfactorily.

The doctor has called our attention to a point which I think is very important, namely, the necessity of remembering that many of these cases only produce bladder symptoms.

I have a woman, who is at the present time in the Deaconess Hospital, upon whom I operated. She had been visiting in Buffalo and came from Elyria, Ohio, but on account of having so much trouble with her bladder she consulted me. I suggested that she undress and let me examine her to see what the condition might be.

She thought that was quite unnecessary, but I told her I should not give any medicine until I examined her. I examined her and found a fibroid much larger than my closed fist pressing upon the urethra and producing these urethral and bladder symptoms. She had no other symptoms whatsoever. She had been treated for months with various diuretics and bladder sedatives.

Another point in connection with these cases is the necessity of always catheterizing these women who have a tumor low down in the pelvis, because it often presses on the bladder and makes an hour-glass bladder. The nurse will catheterize her before she is brought to the operating room, emptying the lower portion of this hour-glass contraction, and leaving a lot of stinking dirty urine in the upper portion of the bladder, making the operation additionally difficult, and if we, at the same time, cut or injure the bladder we may let loose a lot of this infectious retained material. It is necessary to always catheterize carefully these cases where the growth is in the lower segment of the uterus.

I am very much obliged to Dr. West for bringing up his suggestion because it may be useful sometimes, but it seemed to me when the doctor was reading his paper to deliver such a tumor by myomectomy low down in front or behind would be about as hard to do as it would be to put clamps on and separate the uterus.

So far as Dr. Ill's paper is concerned, it is not difficult to persuade patients with fibroid tumors to be operated upon when you tell them the tumor is apt to turn into a cancer, but we all know this is not true, except in the smallest percentage of cases. A few years ago normal salt solution was used in great amounts, 18 to 20 pints in twenty-four hours, and the patient often got at least 2 or 3 ounces of pure salt which was not a good thing for him. Now we are told that ordinary tap water is more quickly absorbed in the rectum and acts even better than the salt solution. Our ideas will soon right themselves with reference to the degenerations which occasionally take place in fibroids. Dr. Noble did a good work along these lines, but I am sure he was carried away by his own enthusiasm and that his conclusions were much above the mark. I agree with Dr. Ill, fibroid tumors very rarely undergo cancerous degeneration. However, I removed two uteri during the past year that contained numerous fibroids from the size of a pea to an egg, and on the top of the uterus of one of these cases one of the fibroids as large as a big egg had become cancerous, and in the other case the tumor which was in the body of the uterus became malignant; nevertheless, in the face of this experience I am not justified in scaring every woman who has a fibroid into an operation, upon the grounds of future possible malignancy. Dr. Ill's statistics are very striking and he has had a very large experience; he says of over 2000 women operated upon by him only 2 1/2 per cent. had cancer, while 4.8 per cent. of all women have fibroids.

Dr. Maurice I. Rosenthal, Fort Wayne.—From a surgical standpoint these fibroid tumors springing from the lower segment of the uterus and cervix are in a class by themselves. I here have a photograph of such a tumor weighing 35 pounds. An operation for the removal of such tumors occasionally becomes a most formidable procedure taxing the skill and experience of the operator to the utmost.

To deliver such a tumor is practically impossible. Springing from the uterus below its peritoneal covering in its growth it lifts the peritoneum with the bowels and sometimes the ureters and in this case even the stomach. The operation itself becomes a combination of enucleation and hysterectomy. A method to a certain extent like that suggested by Dr. West. The circulation, even in this large tumor, is from the uterine arteries. These once secured, together with the parasitic vessels which have formed from the overlying peritoneum, the operation becomes a bloodless one.

The first necessity was making accessible the uterine vessels. This was done by mobilizing the tumor. The peritoneum was split over the tumor and stripped off. This was a somewhat bloody procedure as the tumor was a rapidly growing vascular fibromyoma. Clamps were applied freely. As soon as the tumor could be delivered sufficiently to lift it up into the abdomen the uterus and the broad ligaments which had heretofore been impacted in the pelvis became accessible. The operation was now concluded as an ordinary hysterectomy. As soon as the ovarian and uterine vessels were secured the remainder of the operation was practically bloodless.

In these cases it is necessary to preserve sufficient peritoneum to be used as a plastic in covering the immense denudation left by the removal of the tumor. One should also be very careful lest such a tumor, as it rises from the pelvis in its growth, carry with it the ureters. In this case the ureters were pushed well to either side.

I have a brief history of this case on the back of the photograph together with a diagram showing the relations of the uterus and bladder. Operation, St. Josephs Hospital, Sept. 16, 1912. Mrs. L. Burbon, Ind., aged fifty-two years, multipara, five children. Menstruated at fifteen years. Hemorrhages the last four years. Pain and bladder symptoms increasing until finally quite unbearable. Upward pressure from tumor causing shortness of breath and vomiting. Urinary symptoms intense. Catheterization very difficult, practically impossible. Fever and chills for last two weeks. Operation Sept. 16, 1912, followed by rapid recovery.

Dr. K. Isadore Sanes, Pittsburgh.—I do not believe that any one of us would operate now on symptomless tumors. If a patient comes to the surgeon with a tumor it generally means hemorrhage or pressure symptoms. Shall we operate on these cases or shall we not? Dr. Ill's statistics of 2.8 per cent. of carcinomas in the fibroids to my mind speaks for operation. If a mortality of 2 per cent. for fibroid is the usual result of an operation for fibroids, then the 2.8 per cent. of carcinoma found by Dr. Ill shows he would have had a higher mortality among his patients had he not operated on them. Besides, out of the 400 cases he operated on, if he had let them alone, a much larger number than the 2 1/2 per cent. would have developed carcinoma. I think, therefore, the statistics given by Dr. Ill do not speak against operative interference in fibroid cases. There is another point I want to call your attention to. From our experience we cannot be certain that the 97.2 per cent. of the uterine fibroids operated on by Dr. Ill and found by the laboratory to be uncomplicated fibromas had no early carcinoma. The uterine tumors sent routinely to a laboratory with a clinical diagnosis of fibroid, are not, and cannot be studied sufficiently to definitely exclude carcinoma. For this reason, the statistics of laboratories in such cases cannot be relied upon to give us definite conclusions as to the frequency of carcinoma in uterine fibroid.

Fibroids unquestionably are dangerous when they cause profuse hemorrhage and pronounced pressure symptoms. They are also a source of danger during pregnancy. It is true that fibroids complicating pregnancy are not as dangerous as we have been led to believe. Many of these fibroids lift themselves out of the pelvis during labor and some of them, softened by edema, flatten out by the pressure of the child's head so that delivery follows without complications. But we recall in our practice a case of fibroid so obstructing delivery that it had to be removed before forceps could be applied; also a case of an abscess that developed in a fibroid after delivery and operation had to be performed to save the patient's life. Then there is the postpartum hemorrhage from the fibroid uterus. We cannot say offhand how many of such cases we had, but we know of one that died before anything radical could be done. We do not think anyone operates now on symptomless fibroids, but patients that present themselves with symptoms should be operated on, or good reasons should be given why we should not operate with a mortality of 2 per cent., and with Dr. Ill's statistical observation of a mortality of 2.8 per cent. or more from carcinoma in fibroids not operated upon.

As to myomectomy followed by a secondary hysterectomy in difficult cases, we think that if we enucleate one or more fibroids as a preliminary step of the operation, the uterus can often be delivered easily and we can then easily do the hysterectomy.

Dr. J. H. Carstens, Detroit.—As far as these fibroids are concerned, they are difficult to deal with. When you cut down through the peritoneum and through the fascia, try to get down on the fibroid; you very often do not cut deep enough. You try to peel out the fibroid, but you are just peeling out some of the layers of the thick pelvic fascia; cut down deep enough and get right upon the fibroids, and then you can peel it off easily. If you start to peel it from the uterus to the pelvis, you work against all blood-vessels and tear them. If you start on the outside, you work along with the blood-vessels themselves and separate them without tearing them.

So far as the paper of Dr. Ill is concerned, it is always good to have Dr. Ill with us and now and then to shake us and check us in our advance. We are prone to go too fast. There is too much I think being said about fibroid tumors developing cancer, but I am sure that Dr. Ill and everyone of us have seen cases of fibroid tumors of the uterus, and if we have not seen the fibroid uterus ourselves, by the history we know these patients had fibroid tumors of the uterus for thirty years. The family physician will tell you that, but then all at once the woman develops some serious symptoms, and you operate on her and you will find it is a malignant growth. You have all seen that. You have seen a fibroid tumor in a young girl perhaps twenty-five years of age and that remained there for twenty-five years, and all at once she develops a cancer of the breast. Now, that does not say necessarily that because she had a fibroid of the uterus she developed a sarcoma or carcinoma. We have no right to say that because a woman developed a fibroid or fibroid tumors in the uterus which have been present for thirty years that they will develop into a carcinoma or sarcoma. You might as well say it is sarcoma whether he has had any fibroids or not, or there was a sarcoma planted on top of that.

I had a case six weeks ago of a young woman with a fibroid of the ovary as large as my fist. When I opened the abdomen quite a little fluid came out; there was some ascites. I took the tumor out easily, and sent it to the laboratory. The pathologist said to me that it was a fibroid, a plain simple fibroid of the ovary. I said to him, "That is a malignant tumor." That woman had ascites, and when I find ascites, I am suspicious of malignancy, and I believe it is cancer or sarcoma. I wanted him to make another examination, and the other day he came up and looked over the specimen, said it was an interesting case and was undoubtedly malignant. Now, gentlemen, you cannot fool a man of experience with all your laboratory work, and that is all there is about it. There is something in the clinical symptoms and something in our knowledge and experience that we get which enable us to say that this is or this is not cancer. The question to me is this: cancer may have been implanted on top of the fibroids. It may be independent; it may be that the *cancer has been brought about by the irritation from the fibroid or fibroids.* Notwithstanding this, I do not think there are as many cases of malignancy following fibroids.

Dr. Louis Frank, Louisville.—It seems to me, Dr. Ill's paper is very timely, although I do not think his statistics prove his contention. If we consider the cases in which carcinoma occurs in fibroids in the percentage he mentions, I should say the presence of fibroids has nothing to do with the occurrence of carcinoma. If a woman has a fibromyoma of the uterus, I do not see any special reason why that woman should have a carcinoma implanted upon it. We may have carcinoma implanted on a fibroid independent of the uterus the same as we have a fibroid breast with cancer in the uterus. It shows no necessary relation at all. In my experience I have had cases where these two conditions have been concurrent in the same individual. I have found that in some cases carcinoma of the uterus has begun in the mucosa; that these tumors were not pure mural tumors but rather of the submucous order and the mucosa has been very much thinned out, and it is from this reason possibly the belief originates that these tumors undergo carcinomatous changes. There is a great difference between carcinomatous degeneration and the concurrence of carcinoma and fibroid in the same individual. In a fibroma of the breast of the canalicular type we have a different character of growth. We have cells lining the ducts thrown into activity, and there is great opportunity, on account of cell activity, for carcinoma to develop.

I have met with several of these tumors just as we all have. You separate the bladder first and tie off the uterine vessels, separate the vagina, and have the whole thing at your disposal and under control, and the tumor is lifted out and the operation is completed. I merely secure the uterine artery and isolate the ureters as the primary step in the operation, and one is enabled to do that with ease. As Dr. Rosenthal has said, enough peritoneum should be left to peritonealize the whole structure, and drainage should be established through the vagina by puncture to drain the dead area.

DR. CHARLES N. SMITH, Toledo.—As regards this question of myomectomy in fibroids versus hysterectomy a question which often presents itself to me is, are we doing the best for the future of our patients in doing a myomectomy for a large fibroid? A myomectomy which consists in simply enucleating a pedunculated fibroid or making a small conical incision into the uterine wall and separating the fibroid is one thing. We can leave the uterus in a splendid condition with complete restoration of anatomical structure and of function, and the woman may become pregnant and go on to labor successfully; but where we have a sizable fibroid in the uterine wall, where we incise the uterine wall to enucleate that tumor, to remove some of our redundant tissue and quilt down and close the ragged cavity in, the question is, are we doing the best thing for our patients? Are we doing for her the fair thing? Are we not subjecting her to as much risk in that myomectomy as in doing a complete hysterectomy, and are we leaving her any better off after leaving that multilated uterus in the abdominal cavity? Truthfully, none of my patients on whom I have done myomectomy to any extent have become pregnant. More than one of them have returned suffering from discomforts of one kind or another which have led to a hysterectomy. That is to say, they have solicited hysterectomy. I have one such case in mind at the present time where a fibroid, lying on the posterior wall of the uterus under the bladder, caused so much bladder disturbance that a myomectomy was done. That patient has never been comfortable since that tumor has been removed. She has been relieved of some of the bladder symptoms, but not all, and she is coming to me and soliciting hysterectomy. It seems to me, in these large-size tumors that, unless there is a desirability for pregnancy, we had better do hysterectomy at once than to do myomectomy with the possibility of hysterectomy being forced on the patient later.

Dr. Lewis F. Smead, Toledo.—These cases of cervical fibroid or fibroid in the lower uterine segment, must be divided into two distinct classes, those that are in the vagina, and those that are in the abdomen. In quite a number of these cases the fibroid is entirely within the vagina either primarily or because it has sloughed through the vaginal wall.

During the last year I have had two of these cases with the fibroid in the vagina, one a small one, the other an enormous fibroid weighing 20 pounds. I found it quite a simple matter to cut the large tumor to pieces and remove it through the vagina. I had to put my arm into the vagina nearly to my elbow to reach the lower end of the cervix.

The other type of case is that in which the fibroid is entirely within the abdomen under the peritoneum. In quite a number of these cases the uterus is perched up on top of the tumor, and the whole question to my mind is how to get one's bearings. To do this one must locate the point at which the tumor has arisen from the uterus and the junction between the vagina and cervix. This can be done very easily by passing a sound into the vagina from below. Having located the junction of the vagina and cervix, the rest of the structures can be readily found. It may be found necessary to open the vagina at the base of the cervix and work upward as in the Doyen hysterectomy.

I think that Kelly's method of bisection of the tumor is valuable. I believe that the point of locating the junction of the vagina and cervix is the key to situations in attacking these tumors.

Dr. Walter C. G. Kirchner, St. Louis, Missouri.—I want to speak of one observation in connection with fibroids and cancer, and the point was brought out by Dr. Frank's remarks that we may sometimes find cancer associated with a submucous fibroid. That brings up the matter of hysterectomy and supravaginal amputation. In two or three instances where supravaginal amputation was performed for large fibroids, the complicating condition of cancer of the cervix subsequently developed, and it appeared to me, since others also have had similar experiences, that in these cases in which we have multiple fibroids, and especially where we suspect submucous fibroids, it is better to do a total hysterectomy than to do a supravaginal amputation.

Dr. Thomas B. Noble, Indianapolis – I have been denied the privilege of hearing these papers on account of coming in too late, but there is one thing that has not been brought out in the discussion that I would like to mention. I believe that every fibroid tumor of the uterus should be judged upon its merits. I believe that these tumors should be accused of guilt until they are proven innocent. We all know that these tumors themselves undergo malignancy and malignancy springs up in the uterus along with them, both carcinoma and sarcoma.

Relative to the method of operation, I think it is pretty generally practised that the cervix shall be left. Supravaginal amputation is pretty generally in vogue. I make that statement from cases I have examined that have been operated by my confreres in my own city and elsewhere that I have run across.

I have had the unpleasant experience of having four cases of inoperable carcinoma present themselves following supravaginal amputation, one occurring two years or more after an operation that I had performed myself for fibroma, leaving the cervix. The three other cases were operated upon by other and competent men. Fibromata clinically can be malignant though histologically they may be nonmalignant. Fibromata produce cardiovascular changes that have not been mentioned yet, which render them as highly malignant as if they were histologically so found, especially those that are largely of the myomatous variety.

Unquestionably if each of us would look over our records we would find we have lots of cases of this type, soft tumors, that we can account for only on the ground that there is a secretion from these growths in the body, producing a chronic myocarditis or katamorphic change in the muscle of the heart whereby sudden death, without apparent cause, occurs. I have had several cases in which following a clean operation, a simple operation, as good an operation I believe as I have ever done, sudden death occurred during the first three weeks following the operation from cardiac failure, so I think we must project our vision into the future and scan very candidly each and every one of these fibroid tumors, or fibroid masses, whether they be myofibromatous or fibromyomatous, before we pass them by and let them go unoperated.

Dr. Ill (closing the discussion on his part).—There is no question at all about the interchangeability of neoplasms in families. By that I mean that one member of a family subjected to neoplasm will have an epithelial growth and another a cellular neoplasm. Some years ago I related before this society the story of a family of whom I have a record of 100 years, where, during that time, there were six cases of carcinoma and two of fibroids and one of teratoma. Five of these cases I saw myself. There is no question at all that a patient who has a neoplasm of the cellular tissue, of the muscular tissue, or bone tissue, is just as liable to have a neoplasm of the mucous membrane or cutaneous surface. When he gets a neoplasm of the mucous membrane it is likely cancerous. When he gets a neoplasm of the cellular tissue, it is possibly sarcomatous or only a benign process. I contend however that when a patient has a benign tumor, that tumor rarely changes into a malignant one, when the original tumor originates in cellular tissue. It seems quite different in neoplasms of epithelial origin.

Professor von Recklinghausen, who was my teacher years ago, spoke very definitely of that. A sarcoma would never change into a carcinoma. The structures are entirely different.

Dr. Sanes did not speak of the 2200 cases we have not operated on none of which returned with malignant changes, but merely referred to the cases on which we operated. I do not care to guess what might occur to the operated cases so long as I can show that they remained well. My brother has probably had a larger number of operations, than I have and he has never seen a tumor change to malignancy. I have seen many of the cases he operated on. I have given you the combined experience of two men in over 800 cases, and no malignant degeneration in the growth itself has occurred. I did not intend to say, if I did say so, that a person with a fibroid cannot have a malignant growth elsewhere, but I meant the tumor itself becomes malignant very rarely.

I am simply considering my own personal experience. I have the history of some patients for thirty years, and I have not seen a case of fibroid become malignant. You must take your own personal examination and not that of anyone else, if you want to be fair to this important question. I have never seen a cancer of the cervix follow supravaginal amputation.

The cardiovascular changes are due to two conditions: first, inability on the part of the patient to exercise because the tumor is producing pain, and second, hemorrhage. These are the cases that call for operation. Degeneration of the heart always follows hemorrhagic cases. It does not follow a simple uncomplicated fibroid which you accidently find when a patient comes to you for some other symptoms.

Dr. West (closing the discussion).—I am going to ask you to be good enough to extend your ideas beyond those suggested by these very suggestive pictures. I picked out a series of cases which were interesting, each individually, and on account of certain conditions and collectively on account of the common symptom of blocking of the pelvis and blocking of the urethra. These represent three cases from a considerable number of such cases. I may say these three cases would seem to be the least amenable to a myomectomy which we have to do occasionally to clear up the condition and make the anatomical relations plainer.

The first case which suggested this idea to me was one like that of Dr. Rosenthal. It was an enormous tumor which grew to the diaphragm and caused complete blocking of the pelvis. I cut off the tumor and cut off a considerable portion of the peritoneum because the intestines and other organs were attached to the enormous fibroid. If I had a fibroid growing from the left side and pushing the bladder off and ureter to one side and could see a space of peritoneum there, I would incise thoroughly right through the capsule and shell that out in half a minute, and the bladder and ureter would sink down, and I would go ahead with a hysterectomy. That has been a help to me, and I might add as a suggestion, thinking some other person when he finds difficulties and finds the anatomical relations distorted might shell out the tumor and make it very much plainer for himself. These cases were rather unpromising for a myomectomy, yet in all three of these cases I did a myomectomy.

One woman is now in a perfectly healthy state without loss of uterus, ovaries or tubes, and only a loss of the tumor. The second one had a large tumor which was removed by morcellement, and seven years afterward she was perfectly well. The third woman lost her uterus because it was so injured and pulled to pieces when I got through with my myomectomy I did not feel it safe to leave it behind.

OBSERVATIONS BASED ON SEVENTY CASES OF BOWEL OBSTRUCTION WITH SPECIAL REFERENCE TO THE UNUSUAL CASES.

BY

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I DESIRE in this paper to review the results of some seventy cases of bowel obstruction on which I had occasion to operate, and to present briefly reports of cases which illustrate some of the more unusual types of obstruction and emphasize certain points in diagnosis and treatment. Those surgeons who have been obliged to operate on cases of bowel obstruction must be impressed not only with the seriousness of the condition, but also with the unfavorable results which follow in the wake of a delayed diagnosis and late operation. It is on this account that the subject is of such great importance, and anything that will help to clear up the cause and nature of the various bowel obstructions, should be of service in making an early diagnosis and in instituting the proper treatment.

For our purpose, it will not be necessary to enter into a discussion of the various classifications of ileus, but chiefly to bear in mind that the passage of the intestinal contents may be impeded by various causes, and that as a result of either stasis of bowel contents or of impairment of bowel function, or both, grave constitutional results are apt to ensue.

Intestinal obstruction when situated entirely within the abdominal cavity, is frequently referred to as ileus, and when it occurs in a pouch external to the abdominal cavity, the condition is usually known as strangulated hernia. Since strangulation may occur as readily within the abdominal cavity, and since in the main the symp-

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toms and the treatment in both may be similar, there is no good reason why strangulation outside of the abdominal cavity and the symptoms which are thus produced, should not be considered with a discussion of bowel obstruction. Strangulated hernia is but one phase of the general subject of bowel obstruction.

Those obstructive conditions which are usually referred to as ileus, are designated according to their causes as (a) adynamic ileus, and (b) dynamic ileus. In adynamic ileus, there is absence of power of propulsion, and this may be due to an interference of the nerve control (spinal or mesenteric), to an involvement of the intestinal wall, or to impairment or infiltration of the muscular coat of the intestine.

In dynamic ileus, there is some mechanical form of obstruction which produces strangulation or obturation. Obstructions belonging to the first group on account of the behavior of the bowel, may well be called paralytic ileus, and those of the second group, mechanical ileus.

From the operative standpoint, it is well to have a clear idea as to the cause and nature of the obstruction, for if it be mechanical the obstruction may be relieved, whereas if the obstruction be due to an involvement of the nervous system, reflexly or otherwise, operative measures may avail but little or, indeed, may not be indicated.

Taking the entire group of cases into consideration in which bowel obstruction occurred, the following observations were made:

Cause of obstruction	Number of cases	Bowel resection	Enterostomy	Mortality rate
Hernia	47	15	2	29.8 per cent.
Various (nonhernias)	23	1	3	52.0 per cent.
Postoperative adhesions	10	1	1	50.0 per cent.
Preoperative adhesions	4	....	1	50.0 per cent.

The appendix was implicated in the obstruction, six times, or in 8 per cent. of the cases. Interstitial (concealed) hernia was encountered twice. Enterostomy was performed seven times or in 10 per cent. of the cases with six deaths, while resection of bowel was performed eighteen times in 25.7 per cent. of the cases with five deaths (27.7 per cent.). However, with two exceptions, the resections were in the hernia cases. Strangulated hernia with symptoms of bowel obstruction occurred in 10 per cent. of the cases operated on.

Other cases of obstruction requiring operation were, stricture of the rectum, carcinoma of sigmoid, fibromyoma of intestine, intussusception, volvulus, gall-stone, cysts of mesentery, thrombosis of superior mesenteric artery, prolapse of bowel through mesentery, prolapse of bowel through omentum, visceroptosis and incarcerated Meckel's diverticulum.

Most of the cases operated on were encountered at the City Hospital, and the great majority when received had been obstructed for some time and were in a critical condition. The prognosis in the cases of strangulated hernia was better than in other forms of obstruction, and this, no doubt, was due to the external location of the obstruction, which makes the diagnosis easier and hence encourages earlier operative interference. In many instances, the operation was undertaken as a last resort with the hope of giving the patient the only opportunity for recovery.

It may prove of interest to report a few of the cases that seemed unusual and which may serve to call attention to certain points in diagnosis and treatment.

CASE I.—*Intussusception caused by Fibromyoma of Intestine.*—The patient, a white female, twenty years of age, married, entered the hospital with a history of severe pain in the abdomen. She had been sick for four days. Her trouble started with severe cramps in the abdomen and backache; the pain was most severe in the region of the umbilicus and was exacerbated when turning on her side. She had never had any abdominal pain previous to the present attack, but since then it had been constant. She had taken enemas and cascara, but had had no bowel movement since the beginning of the attack; however, at the hospital, an enema was followed by a slight passage containing blood. Her appetite, as a rule, was good. On the day that she took sick, she had eaten liberally of canned corn and beans. During the past four days she had vomited frequently, the vomitus becoming fecal in character.

There was nothing unusual as to the habits of life and the family history was negative. She had the usual diseases of childhood, but gave no history of bowel trouble or peritonitis. For the two months previous to the attack of illness, she had to take medicine to make her bowels move. The tongue was moist, coated brownish in the center, but clear around the edges.

The abdomen on inspection showed a fullness to the right of the umbilicus; the respiratory movements were about the same on either side. There was but little tenderness on palpation, and muscular rigidity was slight. On deep pressure, there was pain in the region of the umbilicus, though no distinct mass or tumor could be felt. The entire abdomen was tympanitic, except over the region to the right of the umbilicus. The stomach was distended with gas.

The heart action was rapid and the pulse rate, 124, respirations, 34, temperature, 100.8°. Blood examination showed leucocytosis, 16,500; the urine contained albumin and hyaline cysts. From the history and symptoms a diagnosis of intussusception was made and the patient was prepared for operation.

Operation.—A median incision below the umbilicus was made. The intestines were distended with gas and on examination, at a distance of about 2 feet from the ileocecal valve, the intestine was found telescoped, producing an intussusception. The proximal bowel contained liquid feces and gas. By gentle compression from behind and traction, the intussusception was relieved and at the beginning portion, a tumor-like mass, the size of a walnut and somewhat pedunculated, was detected in the lumen of the bowel. The tumor was removed through an incision in the bowel, and the bowel on either side of the tumor having been properly clamped, the incision could be closed without soiling the peritoneal cavity. A glass drainage tube was inserted into the pelvis and the abdominal wall closed in layers.

The patient stood the operation fairly well but continued to vomit material of a fecal odor. Stomach lavage had but little influence on the vomiting and eserine did not relieve the intestinal distention; the patient became cold and clammy, the pulse more rapid and weak and the temperature rose gradually to 106°. She died twenty-four hours after the operation. A microscopical examination of the tumor showed it to be a fibromyoma.

CASE II. *Obstruction of Bowel due to Impacted Gall-stones.*—The patient, a female, entered the hospital in a critical condition and gave a history of vomiting spells for the past week. The abdomen was not greatly distended, though she had characteristic symptoms of bowel obstruction.

Operation.—Median incision was made from the umbilicus to the pubes. The small intestines, which presented themselves, were collapsed. A systematic search for obstruction was made, and about half way along the intestine, a mass blocking the entire lumen of the intestine was found. Proximal to the obstructing mass, the intestine was distended.

The foreign body was removed and it proved to be a huge gall-stone shaped somewhat like a top. The incision in the intestine was closed with a double row of sutures. The gall-bladder region was involved with dense adhesions, but the patient's condition did not warrant further exploration.

The abdomen was closed in layers. The patient died a few hours after the operation.

At autopsy the gall-bladder was found agglutinated to the duodenum. A large stone, the other half of the one removed at operation, had ulcerated through the gall-bladder into the duodenum and was located high up in the intestine.

CASE III. *Obstruction of Bowel caused by Strangulation in the Sac of a Properitoneal Hernia.*—The patient was a colored man, forty years old, a fireman by occupation, well nourished and well developed. He entered the hospital with a history of appendicitis. His respiration was rapid and shallow, the pulse rapid and thready. The abdomen was tense. There was tenderness near the right inguinal region. A diagnosis of bowel obstruction was made and the possibility of hernia with reduction *en masse*, was considered. However, there was no definite evidence of hernia. He took sick five days before coming to the hospital and for the past four days had vomited material which was fecal in character.

Operation.—Incision along right rectus was made and on opening the bowel which was of a brownish-red color, was found distended with gas and fluid fecal matter. In the region to the right of the bladder a mass about the size of a fist was encountered, and it was learned that this mass was a sac which contained strangulated bowel. The ring of the sac was severed in a direction toward the median line and the contents of the sac which was gangrenous, was brought forward, and 2 1/2 feet of bowel were resected, anastomosis being made with the Murphy button. While the resection was being made, the proximal portion of the intestine was drained by means of a rubber tube fastened in the gut. The sac was examined and no communication could be found between that and the external or internal ring. The sac was brought forward with forceps and sutured, a rubber drainage tube having first been put in place. The abdomen was copiously irrigated, and the wound closed with drainage. The patient was put to bed in a critical condition. He died suddenly on the fourth day after the operation, apparently from heart failure which was contributed to by a general septic condition.

CASE IV. *Symptoms of Bowel Obstruction caused by Richter's Hernia.*—This patient gave all the symptoms of bowel obstruction, although the cause of the obstruction could not be ascertained. He was growing weak and believing that the condition was associated with a right inguinal hernia, which, however, was reducible, he was submitted to operation. A radical operation for inguinal hernia was performed; the bowel was examined, but nothing was found to account for his condition. After the operation the symptoms persisted, and he died as if from obstruction of the bowel. At autopsy, a small knuckle of bowel, involving only a part of the wall, (Richter's hernia) was found impacted in the inguinal ring on the left side, producing, however, no external evidence of its existence. The case illustrates the necessity for more extended exploration, when the seat of the obstruction is not evident.

CASE V. *Obstruction of Bowel in a Case of Right Inguinal Hernia of Large Size, Complicated by Cysts of the Mesentery.*—The patient, a colored male, aged thirty-six, was well developed and a yard-man by occupation. He stated that he had noticed a rupture on the right side for nine years, and up to two years ago, had worn a truss. The hernia was of large size, but on the day previous to his admission to the hospital, after heavy lifting, the hernia became still larger and could not be reduced. He came to the hospital in a critical condition. He was prostrated, pulse 110, respiration 30, temperature 100°, abdomen distended, and he had vomited several times. The hernia was as large as an infant's head and ineffectual efforts at reduction by taxis had been made. It was evident he could only be relieved by operative measures.

Operation.—An incision was made, as is usual in hernia operations, and the sac opened up. The loops of bowel were densely adherent to each other and to the sac, and the sac contained the cecum, omentum, as well as a great portion of the small intestines. The operation was complicated by the presence of several cysts of the mesentery, and the large bowel had been stripped of its peritoneal covering, evidently in efforts at forcible reduction. The condition was so serious and complicated that a supplementary median incision was made and the afferent portion of the small bowel near the involved area, was anastomosed into the sigmoid. The patient's condition on the table was such that it was thought best to leave the contents of the sac intact, and when put to bed his chance for recovery was bad.

The patient died twelve hours after the operation. At autopsy it was ascertained that the sac contained 6 feet of small intestines which had been densely matted together. There were also two mesenteric cysts, one the size of the fist, the other the size of a goose egg. Since the hernial ring was smaller than the mesenteric cysts, naturally it was impossible to reduce the hernia. At the constricted portion, there was gangrene of the intestine. The cysts which were within the wall of the mesentery, contained clear, serous fluid.

CASE VI. *Prolapse of Bowel through Rupture in Mesentery; Symptoms of Hemorrhage and Bowel Obstruction; Operation; Recovery.*—This patient, a white male, was thirty-two years of age, a telegraph operator, well developed and in good physical condition, while intoxicated, was struck by an automobile and rendered unconscious. Regaining consciousness, he came to the hospital as a "walker," and upon examination was found to have sustained a fracture at the upper third of the right arm, and abrasions and contusions about the legs, hip and trunk. At this time, there was no evidence of internal injuries. When admitted to the hospital at 3.50 A. M., his record was, pulse 100, respiration 24, temperature 98.8° F. On the following afternoon the record was, pulse 84, respiration 24, temperature 101° F. He complained of abdominal pain and was unable to urinate. A laxative enema was given without result. Blood examination showed 15,300 leukocytes. The abdomen became distended and tympanitic and hot stupes were applied but without effect. The recti muscles were slightly rigid and there was dullness in either flank. The patient complained of intestinal cramps and he vomited fluid containing undigested food. At 7 P. M. his pulse was 118, respiration 24, temperature 100° F., and believing that he was suffering from internal hemorrhage or intestinal injury, he was prepared for operation.

Operation.—Incision was made along the right rectus muscle about the level of the umbilicus. The abdomen contained a considerable quantity of blood which came from either flank. The spleen and liver were carefully examined and no injury was found. The intestines in the region of the cecum were fixed. In a systematic way, the search for injury of the intestines was made, beginning at the ligament of Treitz. The mesentery was bruised in several places, and at one portion, there was a large rent extending from the root of the mesentery to the border of the intestine. This rent in the mesentery permitted a loop of bowel to be prolapsed through it, and in this way the obstruction of the bowel was caused. There was active bleeding from the root of the mesentery and after the obstruction was relieved, the bleeding vessels were ligated and the rent in the mesentery repaired. No further injury to viscera having been found, through a suprapubic opening a glass drainage tube was placed in the pelvis, and the wound closed in layers. The convalescence was uneventful, the patient making a good recovery.

CASE VII.—*Obstruction of Bowel by Prolapse of Loop of Intestine through Adherent Omentum; Operation, Constriction Relieved; Recovery.* —The patient was a white female, aged 40, and previous to present attack of illness, had been in good general health. She had two children but no miscarriages. Several months before entering the hospital, while lifting a heavy object, she felt something give way, but no further trouble was experienced except for a "dragging down" pain. She was also troubled with constipation. The patient stated that previous to coming to the hospital, the bowels had not moved for six days in spite of vigorous catharsis. For the past four days she had been vomiting material which was fecal in character. She experienced a drawing which felt as if the bowels were tied in a knot. She could not retain anything on her stomach and grew weaker and weaker. When she entered the hospital the pulse was weak and rapid, her facial expression was bad, she was very weak, but the temperature was not elevated. The abdomen was not distended, and there was pain on pressure in the epigastrium. She was immediately prepared for operation, the stomach was washed, and hypodermoclysis given and arrangements made for a quick operation.

Operation.—Median incision was made below the umbilicus. The intestine was found collapsed and the omentum was adherent to the pelvic organs. The trouble did not appear to be in the large bowel and a systematic search for the obstruction was made beginning at the ligament of Treitz. About 18 inches from the ligament, there was a band of omentum which produced a constriction and complete obstruction of the jejunum. The loop of bowel had passed through the omentum, the constricting bands being produced by the adhesions at the margin of the omentum to the pelvic organs. A necrosis of bowel had resulted at the site of constriction, the area being covered over with Lembert stitches and reinforced with mattress sutures. The wound was closed without drainage and the patient put to bed in a critical condition.

The patient rallied from the operation and did well until the eighth day when there were two profuse hemorrhages from the bowel. The blood examination showed 9400 leukocytes, hemoglobin estimate, 35 per cent., and Widal's test, negative. The urine analysis showed a trace of albumin and granular and hyaline casts. There was another slight hemorrhage on the eleventh day after the operation. Leukocyte count, 10,200. At the time of hemorrhage, the pulse became accelerated and weak, and the patient grew very weak, but with careful nursing she gradually regained her strength. The abdominal wound healed by first intention, but it is probable that the necrotic area of the bowel broke down causing hemorrhage into the intestine. She left the hospital entirely recovered.

CASE VIII. *Obstruction Due to Excessive Gaseous Distention in the Presence of Angulation.*—The patient, a middle-aged unmarried woman, gave a history of constipation, and when seen in consultation it was learned that the bowels, in spite of the use of cathartics and enemas, had not moved for five days. The patient was nauseated; there was great pain in the upper abdomen and the abdomen was distended and tympanitic. Rectal and vaginal examination was negative. The pulse was of good quality, the temperature was normal, but the patient was growing weaker and the pain was becoming more intense. Operation for obstruction of the bowel was advised.

Operation.—An incision was made along the right rectus muscle above the level of the umbilicus. The ascending and transverse colon were immensely distended with gas, and the colon was 5 to 6 inches in diameter. The descending colon was not distended and the small intestines were collapsed. There was a ptosis of the transverse colon which descended nearly to the pelvic brim.

The colon was kinked at the hepatic and at the splenic flexure, and it was impossible to force the gas into the descending colon. Jackson's membrane covered the ascending colon, and this part of the bowel was constricted in two places. A careful search for the cause of obstruction was made and it was ascertained that the source of the trouble was at the splenic and hepatic flexures. Gas having accumulated in the large bowel, the transverse colon, which hung low like a hammock, formed an obstruction at either point of suspension. The greater the distention, the more complete was the obstruction. A large trocar was inserted into the distended bowel, and the gas and fluid fecal contents allowed to escape.

The opening in the bowel was closed with a purse-string suture. The abdominal wound was closed in layers without drainage, and the patient put to bed in a comparatively good condition. The patient had received great relief from the operation, but a violent streptococcus peritonitis set in which carried the patient off in the third day.

CASE IX. *Thrombosis of the Superior Mesenteric Artery causing Symptoms of Bowel Obstruction.*—The patient, a widow, fifty-two years of age, was a cook by occupation. There was nothing unusual in her habits of life, and her family history was negative. The menopause occurred in her thirty-eighth year, and she stated that she had been troubled with a diarrhea (three to five movements a day), and that there was pain in the back and rectum (tenesmus) when the bowels moved. The stools were watery and yellowish in color, but at no time had she noticed any blood. More recently the appetite was poor, and two weeks before coming to the hospital, she had pain in the abdomen, vomiting, and she grew weaker and felt exhausted. She had had neither chill nor fever.

On admission to the hospital the patient was in considerable distress, complaining of a diarrhea and an abdominal pain which extended from side to side at the level of the umbilicus. She had vomited once. The pulse was 100, respiration 30, and temperature 99.4° F. At this time a provisional diagnosis of dysentery was made, and the patient was allowed to get up. On the second day the morning record was pulse 96, respiration 20, temperature 98.6° and the afternoon record, pulse 100, respiration 52, rectal temperature 100° F. Examination of the heart and lungs had been negative. The abdomen was not distended, and percussion, while painful, was not unbearable. Early in the morning of the third day, the pulse rate increased to 120, respirations were 44, and the temperature 100.4° F. The bowels did not move for three days, although there was frequent desire, and an alum enema was administered which was returned with a "coffee-ground" evacuation, giving evidence of hemorrhage high up in the intestinal tract.

The abdomen was now distended, painful on pressure, asymmetrical with bulging on the right side, and tympanitic except on the right side low down, where the percussion tone was flat. The liver dullness was not obliterated. On vaginal examination, which was without much pain, the uterus was found fixed and there was evidence of a chronic endometritis. The pulse was rapid and weak, but the facial expression was good. The breath had a peculiar sweetish odor which is sometimes noticed in fatal cases of peritonitis. The urinalysis gave a trace of albumin, and the blood examination showed 31,000 leukocytes. The patient had a right femoral hernia, which was the size of an egg, but it was easily reducible, and strangulation of bowel was considered improbable. An exploratory operation was thought advisable, although the patient was now in a critical condition.

Operation.—The operation was performed by Dr. J. Y. Brown, myself assisting, and was exploratory in nature. The incision was in the region of the femoral hernia, the sac was opened up, but no obstruction was found in this region. The abdominal cavity contained a considerable quantity of a dark colored serous fluid, and the condition of the patient prohibiting further exploration, the abdominal cavity was merely drained. The patient died a few hours after the operation.

At autopsy the intestines were found to be distended with gas and were mostly reddish brown in color. One area involving about 5 feet of intestine, was greenish in color showing gangrene. The appendix was normal. The liver showed central atrophy. The spleen was hard and showed an interstitial splenitis. The uterus was bound to the adnexa by old adhesions. The kidneys showed a chronic diffuse nephritis. There was evidence of an old pleurisy, but the lungs and heart were normal. The branches of the superior mesenteric artery and veins showed thrombosis.

The etiology of the thrombosed condition was not clear; however, it may be explained by a preexisting arteritis, or perhaps by injury to mesentery or intestine resulting from reduction of contents of the hernial sac.

There are many factors which must be considered regarding the cause of intestinal obstruction, and the previous history may help in determining the cause. In paralytic ileus, sepsis through its influences on Auerbach's plexus is a frequent cause, especially after operation. Sometimes injury to ribs through reflex action causes paralytic ileus; among the other causes are tumor, strictures, infiltration, and thrombosis of mesenteric vessels. The mechanical obstructions may be various and are frequently caused by adhesions, prolapse of intestines into fossæ and cavities, intussusception, kinks of the bowel with impaction, obturations due to foreign masses, to impacted feces and to gall-stones, compression or incarceration due to tumors, by twists of the intestines or volvulus, and indeed by any means which may lessen or obliterate the lumen of the intestine.

Under normal conditions, the contents of the stomach is discharged into the intestine and is propelled toward the rectum. However, under certain conditions of bowel involvement, as in obstruction or perhaps also under other conditions, peristalsis is reversed and the intestinal contents is discharged into the stomach. Numerous experiments and observations have been made to prove that reverse peristalsis may take place, and this fact may help to explain the formation of certain cases of intussusception. I have observed as others have, that in some cases of intussusception, the distal portion of bowel ascends or creeps over the proximal portion. Another cause of obstruction which I have observed and which has not been sufficiently emphasized, may be attributed to the accumulation of gas in the bowel and thereby to cause overdistention and consequent obstruction when kinks are present or even when the normal flexures are involved. This is particularly true in cases of sagging of the transverse colon which, when distended with gas, may by kinking at the hepatic and splenic flexures, produce absolute obstruction with all of the distressing symptoms. Such a condition was found in Case

VIII, and I am acquainted with similar cases in the experience of others.

From a review of the cases reported an idea of the symptoms may be had. Naturally the symptoms will vary somewhat with the nature of the obstruction. In the latter stages of obstruction the symptoms of the various obstructions are nearly identical, while the initial symptoms may be grouped in two classes, the one in which the obstruction is gradually produced, the other in which the obstruction takes place more or less suddenly.

Where the obstruction is gradually produced, there is usually a history of constipation, straining, gas in the intestines, and increased peristalsis of a remittent type accompanied by griping or discomfort rather than by acute pain. When the obstruction is complete or acute, there is usually more or less sudden and violent pain in the intestine, at first perhaps diffuse, but later usually localized at the site of obstruction. The pain is remittent and accompanied or preceded by peristalsis which may frequently be felt through the abdominal wall or seen on the surface. With the stethoscope the gurgling of gas in the intestine may be heard and this helps to distinguish mechanical ileus from paralytic ileus. The temperature, respirations and pulse at first are little, if at all, influenced. As the condition progresses, nausea and vomiting ensue, the vomitus finally becoming fecal in character. The bowels move slightly or not at all and flatus is not expelled. Cathartics tend rather to aggravate the condition. In intussusception, there is frequently blood and mucus passed per rectum. The temperature is usually not elevated, and, unless peritonitis or other complications set in, often becomes subnormal. The respiration is usually uninfluenced except in extreme conditions, when it is gasping. The pulse becomes more rapid, weak and thready. The skin becomes cold and clammy, the patient becomes restless and looks sick.

The diagnosis is important and efforts should be made to determine whether the obstruction is of the paralytic or mechanical type and, if possible, to determine the nature of the obstruction. With obstruction, there is usually a lack of bowel movement, and in the paralytic type, there is distention of bowel, lack of peristalsis and, therefore, no gurgling of gas in the intestine. Sepsis, injury to or involvement of mesenteric or spinal nerves, or reflex nervous influence, may be the cause of paralytic ileus, and should be given careful consideration in the diagnosis. With a history of constipation, the presence of acute abdominal pain, cramp-like in character, and a tendency to localization of pain which is accompanied or preceded by intestinal peristalsis, there exist symptoms which are very significant of an early obstruction. Especially is this true if the abdomen is but little distended and the temperature, pulse and respirations are normal, and the patient has not eaten anything to cause intestinal disturbances. If nausea and vomiting ensue, the diagnosis becomes more evident. These early symptoms are often present when the obstruction is caused by postoperative adhesions, kinks in the bowel caused by adhesions, tumors of the intestines, volvulus, intussusception, strangulations, etc. In gall-stone obstruction, there may be a history of gall-bladder disease, and the acute obstruction may be preceded by repeated milder forms of obstruction due to passage of the stone and by shifting of abdominal pain. In intussusception there is usually blood and mucus in the stool, and a tumor mass may usually be felt. Blood in the stools may also be found in ileus due to thrombosis of mesenteric vessels. In volvulus and in intussusception, there may be asymmetry of the abdomen.

As the symptoms of obstruction advance, the vomitus becomes fecal in character, the pulse rapid and weak, the facial expression pinched, the skin takes on an ashen hue and becomes cold and clammy; the tongue becomes coated and dry, and the patient gets thirsty and restless. Depending upon the location of the obstruction, the abdomen will remain flat or distended. If the obstruction is low down, it may sometimes be detected by rectal examination.

Although some forms of intestinal obstruction are relieved by medical means, the condition is essentially surgical and the sooner physicians and the laity recognize this fact, the better will be the opportunity of curing these cases. Most patients with intestinal obstruction who die, are lost because they reach the surgeon too late. Perhaps the chief reasons for this lies in the fact that the condition of obstruction is often not recognized by the physician as well as by the patient, until terminal symptoms present themselves. Fecal vomiting and collapse are terminal symptoms, and patients with such symptoms offer little hope for recovery because the vital centers have already been involved and, therefore, relief of the obstruction may benefit the patient but little. Those patients that are operated on in the early stage of obstruction before systemic changes have taken place, almost uniformly recover. The retention of fecal material in the intestines in the presence of obstruction, acts as a powerful poison, and the sooner the poisonous material is permitted to escape from this system, the better the opportunity for a cure. Better still are the chances for the patient when the obstruction is relieved before these toxic elements have had an opportunity to form. It behooves us, therefore, to operate when the first symptoms of obstruction present themselves, if we wish to improve our results in this class of cases.

The need of early operation is emphasized by the fact that in the early operations, the patients almost uniformly recover, while in the late operations, the mortality rate is high. If it is rational to operate early in appendicitis, the argument should maintain with greater force in intestinal obstruction. In the early operation, we have the reserve forces of the patient on our side; in the late operation the vital forces are at lowest ebb.

A great deal has been written about the treatment of intestinal obstruction, but the simpler the technic, the better will the results be. Above all, it should be the aim to look after the patient as well as the condition from which he is suffering. Therefore, one should do those things, that will preserve the patient's strength, as well as to look after the surgical feature of the case. In the early conditions, the methods which apply to the usual cases submitted to laparotomy may be used.

In the late cases, the stomach should be washed before operation and appropriate stimulation instituted. The operation should be short, so that little anesthetic need be used and the shock of operation lessened. In the early cases where the bowel and bowel contents are nearly normal, resection of intestine may be resorted to, if indicated. In the critical stages, it is safer not to resect but to perform enterostomy. Since the unfavorable results are dependent upon infection and on retention of fecal material, it is well, before opening the bowel, to suture it in the abdominal wound, so that the peritoneal cavity may be protected against infection. However, in certain cases it may be advisable to relieve the distended bowel of gas and fecal material by the passage of a tube and thus to lessen the toxemia. The cause of obstruction with the involved area of bowel may be brought outside the abdominal cavity, clamped and removed, or, if the urgency of the case demands it, may be left outside the abdominal cavity and removed later.

After the patient has regained strength, the fecal fistula should be repaired and the continuity of the bowel reestablished by the most appropriate means.

In the selected cases, primary resection, when indicated, gives the best result. In the critical cases, it is safer to resort to enterostomy and at a subsequent operation to repair the fecal fistula. The limits of the paper will not permit of details in the technic of operation.

CONCLUSIONS.

Obstruction of the bowel is essentially a surgical condition and the mortality rate is increased in direct proportion to the duration of the obstruction.

Greater stress should be laid on the necessity for early operation in cases presenting symptoms of bowel obstruction.

In strangulated hernia, where symptoms of bowel obstruction are present, the cases come earlier for relief, and the pathology being in a great measure external to the abdominal cavity, resection of bowel is a safer procedure than in other obstructions.

In the early cases of obstruction, resection may be a safe procedure. In the critical cases, primary enterostomy and later resection of bowel or repair of fecal fistula is the better course to pursue.

508 METROPOLITAN BUILDING.

FIBROMA OF THE INTESTINE, EVENTUATING IN INTUSSUSCEPTION AND OBSTRUCTION.

BY
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CASE.—Miss O. R., fifteen years old, not strong at any time but ordinarily well, during the last three months suffered occasional abdominal disquietude. This on three occasions attained increased severity, requiring medical attendance. Sickening, colicky pain and burning, mild vomiting, without fever, attended these attacks. The second attack confined the patient to bed for eight or ten days, and left her sore for several days more. The medical attendant of the first two attacks, I am told, feared appendicitis. During the present attack the patient suffered greater pain, and the abdomen became much distended. Purgatives had caused much griping, without bringing any stool, though some gas was passed by rectum. Intestinal obstruction was diagnosticated when I was sent to see her at her home in Fortville, Ind., February 25, 1913. I saw patient the sixth day after the onset of acute symptoms. Oral temperature 99.2°, rectal 100.4°. Pulse, previously about 80 to 90, during this day had acutely weakened in force and ran 110 to 124. The abdomen was considerably distended, variably tender to pressure in various parts. There was tumefaction and dull percussion in different parts of the abdomen, notably about the lower right side. Inspection revealed very little evidence of peristalsis. Auscultation marked a lull of intestinal activity, interrupted by a few tinkling notes in quick succession. The evident gravity of the affection

[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

indicated by the sudden cardiac depression, the rise in temperature, and the intestinal obstruction, indicated immediate operation, though definite diagnosis was impossible. Torsion of small intestine, appendicitis with gangrene, pancreatitis, among other diseases were regarded as possibilities. Patient was transported to the Methodist Hospital at Indianapolis, and operation performed at once. Narcosis consisted of two H. M. C. Abbott tablets followed by ether. Median incision from umbilicus downward. Free, clear fluid was found within the abdomen. The small intestines were greatly distended and edematous. The ileum, upward from a point about 10 inches from the cecum, was thickened into a banana-like swelling about 10 inches in length. This portion was dark red and edematous. Doughy in feel throughout its entire length, the consistency was greater at the distal end for about 2 inches, and in firmness like a myoma. Further examination revealed an intussusception to exist, complicated by an intraintestinal tumor. Painstaking efforts were successful in completely returning the bowel, when there was revealed an oviform tumor 1 1/2 inches by 2 1/4 inches of myomatous consistency. This tumor was sessile rather than pedunculate, from the crest of the intestine, indicated by a whitish, indurated and depressed spot the size of a nickel. Three inches of the small intestine were resected, and an end to end anastomosis established. A lesser excisio seemed not warranted because of the acute pathological changes the bowel wall had undergone. Recovery followed without vomiting or even any of the ordinary disturbances attending an abdominal operation. The microscopic examination of the tumor showed it to be myoma. A cursory search in literature reveals intestinal tumors of this size and kind of rare occurrence. Some special works, Hemmeter, Tuttle, Kelly, barely refer to the subject. Subsequent inquiry revealed that the patient, always rather quiet and inexpressive, had latterly become quite inactive and reticent. She was wont to sit stooped forward, with her thighs crossed to the utmost, a position which would favor fullest quietude and external support of the intestines. The patient herself, on being questioned, thought that she had not suffered much pain or distress, except in the three attacks above referred to. It is likely that an intussusception of mild degree had occurred repeatedly, and in turn had extricated itself spontaneously, before the final attack was developed.

224 NORTH MERIDIAN STREET.

STENOSIS OF THE PYLORUS IN INFANCY WITH REPORT OF CASES.[1]

BY
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Providence, R. I.

I WISH to place on record a number of cases operated upon for stenosis of the pylorus in infants by myself and colleagues by pyloroplasty and to call your attention to the procedure as being more desirable for the relief of this condition than that of gastroenterostomy. I here add six cases to the two reported to this Association last year—Cases III, IV, V, VI, VII, and VIII.

Stenosis of the pylorus found in infancy is due to a hyperplasia of the circular muscular fibers of the pylorus and to a slight degree the involvement of the longitudinal fibers. This mass of muscle, which feels at times almost as hard as soft cartilage, throws the mucous lining of the pylorus into longitudinal folds and the mucous membrane being also swollen we have produced a narrowing or complete obstruction of the lumen of the pylorus. This condition of the pylorus is permanent, as shown by autopsy months following a gastroenterostomy. The pyloric tumor was found the same as at the time of operation.

Dr. Dodd has made numerous skiagraphs following the ingestion of bismuth by patients who had been operated upon for stenosis of the pylorus by a gastroenterostomy. He found that no bismuth passed the pylorus in any of the cases examined, thus showing that the original cause of the obstruction persisted.

We cannot too frequently lay stress on the symptoms and signs that enable us to diagnosticate this condition, because when an early diagnosis is made one can at once resort to surgery with a better chance for success. The high mortality is due in a great measure to delayed operation.

The disease usually is found in male infants who have been breast fed and are healthy in appearance. From one to five weeks after birth it is noticed that he regurgitates the milk after feeding and later rejects about all the food taken. The vomiting may occur immediately after nursing or be delayed for one-half hour or more. At times, the fluid taken may be retained for two or more feedings, and then the quantity taken at all the feedings is vomited. The child may vomit but once or twice in twenty-four hours. The food is expelled suddenly and with considerable force from 1 to 6 or 7 feet. This propulsile or projectile vomiting is characteristic of obstruction. We note the forcible character of the vomiting and also that the vomitus may come through the nose as well as the mouth. The bowels are constipated and the movements are usually green, unhealthy and slimy. Changing the diet does not arrest, for any length of time, the loss in weight which soon becomes alarming.

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

The abdomen is distended in the epigastric, and contracted in the lower abdominal, region. The abdomen should be examined immediately after the infant has been fed for visible peristalsis of the stomach. The peristaltic wave is seen passing transversely from left to right and terminating in the right hypochondrium. Deep palpation, just outside the nipple line and about one-third the distance from the umbilical level to the costal margin, reveals a hard olive-shaped mass, 3/4 inch long by 1/2 inch wide, in the majority of cases.

While a pyloric tumor may be palpated in most of the cases, it may be so covered by the liver that it would be impossible to detect it. I have noted a case where three physicians thought that they could feel the tumor, yet on opening the abdomen they were in error, as it was tucked away under the liver and could not have been felt. We all realize how readily we may be mistaken if we have some preconceived idea as to what we should feel during an abdominal examination. I believe that we should not lay too much stress upon our ability to demonstrate by palpation previous to operation the presence of a pyloric tumor. Should the other signs and symptoms be marked, we should not hesitate to operate.

The *x*-ray may give us valuable aid by showing us that a solution of bismuth does not pass beyond the stomach. It is, therefore, desirable that we employ the *x*-ray to assist us in determining the presence of obstruction of the pylorus.

The characteristic symptoms are: vomiting in a healthy breast-fed infant, usually a boy; later vomiting propulsile in character; loss of weight; constipation; prominent epigastric region; visible peristalsis of the stomach; palpable pyloric tumor.

The medical treatment consists of washing the stomach twice a day with a solution of bicarbonate of soda, grain one, to 1 ounce of sterile water. Rectal injections of 1/2 pint of normal salt solution three times a day. Small quantities by mouth of hot water, modified milk, peptonized milk, meat juice or albumin water. Feeding through the nose, by the aid of a small rubber catheter, with water, ounces 2; barley water, ounce 1, may be of value.

The operative procedure that I advocate consists in making a vertical right rectus incision into the abdominal cavity thus exposing the pyloric tumor. An opening 1/2 inch long is then made through the wall of the stomach about an inch from the pylorus. Through this opening a small-sized sound or probe is passed into the lumen of the pylorus and retained there. The serous and muscular coats forming the pyloric tumor are divided with a knife down to the mucosa. This incision is parallel to the long axis of the bowel. The hypertrophied muscle on either side of the incision is now separated from the mucosa laterally over half the circumference of the pylorus and a small portion of the muscle removed, which allows an accurate transverse approximation of the wound. This procedure permits the subsequent easy passage of larger sized sounds until the lumen of the pylorus is sufficiently patulous, and by this method the longitudinal folds of the mucosa are smoothed out without injury. The longitudinal incision through the serous and muscular coats of the pylorus is now closed with interrupted Lembert sutures of linen, so that the line of union is at a right angle to the long axis of the bowel. The result is that the pylorus is wider at this point than it was before the operation.

The wound in the stomach is closed with two rows of sutures. The abdomen is closed in the usual way, approximating the peritoneum, muscles and skin.

Gastroenterostomy is attended with a high rate of mortality, about 50 per cent. save in the hands of expert surgeons. Deaths have occurred from intestinal obstruction several weeks following the immediate effects of the operation. Jejunal ulcers may form at the site of the stoma giving rise to serious trouble.

The operation by pyloroplasty may be performed with success by a surgeon of average skill. The first patients operated upon by myself and colleagues all recovered. The operation may be performed more rapidly and with less trauma to the tissues and consequently less shock to the patient than the operation of gastroenterostomy. We directly remedy the defect at the site of the obstruction and leave the parts more nearly as nature intended that they should be.

I believe that the operation of pyloroplasty or pyloroplasty combined with the passage of smooth sounds through an opening in the stomach and the lumen of the pylorus will ultimately be the operation of choice.

Case of Stenosis of the Pylorus; Pyloroplasty; Death; Dilation of the Pylorus by a Sound passed through an Opening made in the Stomach.—S. F., boy, nine weeks old, entered the Rhode Island Hospital June 18, 1908. He weighed at birth 12 pounds. The baby was fed on both breasts for ten days, when the left breast became inflamed and an abscess developed. He nursed the inflamed breast for three weeks. During the last three days of nursing he vomited each feeding and was given modified milk and the normal breast. He vomited most of the feedings during the next three weeks. Bowels constipated and stools green in color.

Admitted to medical service; diagnosis of pyloric obstruction was made and operation advised. Parents took patient home June 10.

Readmitted June 24 to the surgical service. Baby pale, poorly nourished. Stomach distended after feeding; abdomen slightly flattened. Marked gastric peristalsis readily noticed. No tumor mass felt. During the child's stay in the hospital he vomited most of the food taken.

Operation, June 26, 1908, by Dr. Keefe. Pyloroplasty.

Dilation of the pylorus through the wound made in the stomach. A two-inch incision was made through the abdominal wall just below the ensiform cartilage and between the recti muscles. The pylorus was found greatly thickened, hard and of an almost cartilaginous nature. The stomach was slightly distended. An incision was made in the stomach near the pylorus and a small sound was passed through the constricted pyloric opening. A longitudinal incision was now made through the pyloric tumor down to the mucosa. Large sounds were then passed through the opening in the stomach and into the pylorus. The wound in the pylorus was closed in a transverse direction to its long axis. The stomach and abdominal wounds were then closed.

The patient was in fair condition at the close of the operation; during the night he became very restless, gradually grew weaker and died toward morning.

Case of Stenosis of the Pylorus. Pyloroplasty. Recovery. Dilation of Pyloric Canal through Wound in the Stomach.—H. J. D., a healthy vigorous child, born December 23, 1912; weight at birth 8 pounds and 13 ounces. Breast fed; mother had an abundance of milk. The baby lost 10 ounces the first three days, then gradually gained in weight to January 20, 1913, when the baby began to vomit all fluids taken into the stomach. As a rule, the stomach emptied itself directly after the child was fed, but at times half an hour or even two hours would elapse before the vomiting occurred. Upon taking nourishment the child appeared uncomfortable and distressed, but as soon as he vomited he seemed relieved and would usually go to sleep.

The first four days that the baby vomited, the vomitus was only occasionally projectile in character, but later it became entirely so. The vomitus contained milk mixed with mucus and was curdled, not soured. On January 28 peristaltic waves were discernible over the abdomen. Various medical measures were adopted in an effort to control vomiting; changes were made in the preparation, quantity and character of food and period of feeding. Saline drips and nutritive enemata were given, but with very little success. The baby's weight gradually decreased until January 31, the day of the operation, when he weighed 9 pounds and 2 ounces.

I was called to see the case by Dr. DeWolf on January 27. A diagnosis of stenosis of the pylorus was made and surgical treatment recommended if improvement did not take place. January 31 Dr. Morse, of Boston, was called in consultation and advised operation.

Operation. Pyloroplasty. Dr. Keefe, January 31, 1913. Dilatation of the pylorus through a wound made in stomach.

A high incision, about 1 1/2 inches long, a little to the right of the midline, was made through the abdominal wall. The pylorus was exposed. Examination showed a firm, resistant, pink-colored tumor at the pylorus the size of a small olive. A small incision was made through the wall of the stomach about 1 inch from the pylorus. Through this opening a small-sized steel sound was gently passed into the pyloric canal and held there. The serous and muscular coats of the pyloric tumor were divided down to the mucosa. The sound was removed from the pyloric canal and a larger sized smooth metal sound was introduced without the least difficulty. On either side of the incision for about a quarter of an inch a wedge-shaped piece of pyloric tumor was carefully dissected from the mucosa and peritoneum and removed. The edges of the incision were united so that the line of union was transverse to the long axis of the bowel. Interrupted and Lembert sutures of fine linen thread on a straight intestinal needle were used. The wound in the wall of the stomach was closed with double rows of the same material. The abdomen was closed with sutures of chromic catgut and the skin approximated with linen thread.

Directly following the operation the child was in shock. It was necessary to resort to stimulation and strychnia in minute dose; brandy was also given. The baby responded bravely and soon showed a decided improvement; later morphine in minute doses was given, as directed, for pain. Drip salines were continued. Eighteen hours after operation the mother's milk, diluted with lime water, was given by a medicine dropper. Fifty hours after operation there was no more vomiting, although occasionally food would regurgitate. On the fifth day the baby was given the mother's breast and nourishment was retained.

The cutaneous stitches were removed on the eighth day; the wound healed nicely. The baby gradually gained in weight. Two weeks after the operation he had gained 14 ounces. There has been a steady general improvement and the baby appears to-day to be a normal and healthy child.

Case of Stenosis of the Pylorus. Pyloroplasty. Recovery.—R. G., boy, four weeks old, admitted to the Rhode Island Hospital under the care of Dr. E. B. Smith, April 18, 1913.

A normal breast-fed baby; weight at birth 9 1/4 pounds. During the first two weeks the mother noticed that the child regurgitated a part of each feeding. Since then the child vomited after each feeding. The baby is apparently hungry and greedy for food. Bowels constipated; have not moved for two days. Enemas given. The movements are small in amount, very dark brown in color and have lumps in them. Baby well developed, but poorly nourished. Visible peristalsis. Tumor palpable.

Operation, April 23, 1913, by Dr. E. B. Smith. High mid-rectus incision. Pylorus found thickened and firm, and as large as a medium-sized olive. A longitudinal incision was made through the pylorus into its lumen. This opening was brought together in the opposite direction with silk sutures. The abdominal wound was closed in layers.

May 6. The baby was discharged from the hospital improved.

September 8. The baby has remained well to date.

Case of Stenosis of the Pylorus. Pyloroplasty. Death. Sounds passed through an Opening made in the Stomach and into the Lumen of the Pylorus.—R. F., boy, born April 21, 1913, now one month old, under the care of Dr. Jordan. A healthy breast-fed baby.

A brother was operated upon for the same trouble five years ago at the Rhode Island Hospital.

Adenoids were removed when the baby was one week old. When three weeks old he began to vomit. During the past four days the vomiting has been of the projectile type. Bowels constipated. The removal of the stomach contents several hours after feeding showed a few ounces of milk. Although the food has been changed a number of times, the child is losing weight and becoming weaker.

He is well developed, but poorly nourished. The epigastric region is distended and the lower abdomen flattened. Peristaltic waves may be seen passing from left to right in the epigastric region following the ingestion of food. No tumor palpable.

Operation. Pyloroplasty. Dr. Keefe, May 21, 1913.

Epigastric right rectus incision. Definite tumor of the pylorus found, of a firm cartilaginous consistency. A small sound was passed through an opening made in the stomach and through the pyloric orifice. The wound in the pylorus was brought together in an opposite direction with Pagenstecher interrupted sutures. The incision in the stomach and the abdominal wound were closed.

The child rallied fairly well from the shock of the operation, but died the next morning.

Case of Stenosis of the Pylorus. Pyloroplasty. Recovery. Pylorus dilated through the Wound made in the Stomach.—V. K., girl, seven weeks old, entered the Rhode Island Hospital July 7, 1913, under the care of Dr. Kingman. Seen in consultation by Dr. Keefe.

The baby for several weeks after birth was fed on a variety of foods and modifications of milk without being able to check the vomiting. At times, three or four feedings were retained, then vomited the entire amount. The mother said "the vomiting was shot across the room at times." Bowels moved frequently, but stools have been small and dark green in color. Loss of weight.

There is visible peristalsis over the stomach following the ingestion of food. Vomiting projectile. Palpation of a pyloric tumor doubtful.

Operation. Pyloroplasty. Dr. Kingman, July 7, 1913. Sounds passed through an opening made in the stomach.

An incision was made in the right upper quadrant and the stomach and the pylorus were brought into view. The pyloric ring felt hard, but not greatly enlarged. The pyloric lumen was smaller than normal. An opening was made in the anterior wall of the stomach near the pylorus. An incision was then made through the pylorus in a longitudinal direction through the mucous membrane. Graduated Hank's dilators were passed through the opening in the stomach and the lumen of the pylorus. The wound in the pylorus was closed transversely, thus widening the lumen of the pylorus at this point. The abdominal wound was closed with chromic and silkworm gut. Good recovery from the operation.

Discharged from the hospital July 23, improved.

September 5. Baby continues to improve.

Case of Stenosis of the Pylorus. Pyloroplasty. Recovery.—M. R., girl. Entered the Rhode Island Hospital August 7, 1913, under the care of Dr. Mattison. She is now seven weeks old and was a healthy breast-fed baby. Her weight at the fifth week was 9 1/2 pounds. During the last two weeks she has vomited a great deal. Regurgitations of milk occurred occasionally after feeding and was the first symptom noticed. Now most of the milk taken at a feeding is rejected. The bowels are constipated, two or three days elapsed without a movement. The feces were green in color and the odor foul.

She is a well-developed and fairly well-nourished infant. Pyloric tumor palpable. Visible peristalsis.

August 11. The baby continues to vomit. The movements are small, green and foul. She has lost 10 ounces during the last four days.

Operation. Pyloroplasty. Dr. Mattison, August 12, 1913.

A high right-rectus incision was made. The stomach and pylorus were drawn into the wound. There was a tumor of the pylorus as large as the end of one's thumb. A longitudinal incision was made through the tumor mass down to the mucosa. A V-shaped piece of the tumor tissue was removed from each side of the incision. The incision was then closed in the opposite direction. The abdominal wound was united in layers.

August 14. Vomits less. Child was being carefully fed at hospital, but parents thought the baby was being starved and they took the child home the twenty-second day after operation against advice. Child then went rapidly down and parents again brought her to the hospital after a week. Child was admitted the second time in poor condition with a gastroenteritis and died in two days.

Specimen shown.

Case of Stenosis of the Pylorus. Pathological Specimen.—I wish to pass about a pathological specimen sent me by Dr. Utter. It was removed postmortem from a girl eight weeks old, with the following history.

The babe was constipated and vomited for past six weeks. She was a full-term infant weighing 10 pounds. Breast-fed for five weeks, then prepared foods and modified milk were given. Feedings usually vomited immediately, rarely, one hour after taking. The symptoms subsided for a day or two after each change of feeding, only to recommence. Constipated since birth; an occasional hard green stool following an enema. Losing weight rapidly; drowsy for two days. Present weight 5 pounds and 11 ounces. Extremely emaciated. The skin dry, hung in folds on the extremities; she was the picture of complete dehydration. The abdomen was generally distended. A small tumor was felt in the right upper quadrant; visible peristalsis was marked and the stomach extended below the umbilicus.

Stomach contents showed 3 3/4 ounces of dark green sour material.

Operation by Dr. W. A. Downes of New York, five hours after admission to the Hospital. Gastroenterostomy. Died thirty-six hours afterward. She was a poor surgical risk and emphasizes the advice to operate early.

259 BENEFIT STREET.

FIBROMA CARDIA IN A GIRL OF EIGHTEEN. GASTROSTOMY AND ENUCLEATION.[1]

BY
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MISS W., æt eighteen, was seen by me in consultation with Dr. H., her family physician, at the age of fourteen some four years ago. When I saw her she presented the appearance of an almost exsanguinated child, and gave through her parents and Dr. H. the following history:

On one occasion some months before (having been a perfectly well child up until that time) she vomited without any previous pain, etc. This day, the day of my consultation, while in school she suddenly became nauseated and vomited a large quantity of blood, without pain at any time. Several attacks of vomiting followed in her home, the quantities estimated at fully a pint of almost pure clot and liquid blood at each vomitus.

Examinations of the chest, etc., were negative. The diagnosis by exclusion was ulcer of the stomach or varicosities. Morphia and rest were followed by absolute cure and repair in a few days.

Eighteen months later she had another severe attack of like nature, and at this time she developed jaundice, but had had no pain, and no temperature. A rapid recovery again took place.

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

October, 1912, about eighteen months again, she had another similar attack. With this attack she had a profuse menstrual flow and bleeding gums. This time six weeks were required for her return to normal health.

March 12, 1913, she had her last attack, which was preceded by a sense of uneasiness and flatulence the last week in February.

About the middle of April, 1913, she vomited once, containing no blood or food contents. Her last menstruation occurred about the middle of March. During these attacks, subsequent to the one in 1909, and her periods of quiescence, she was seen by various physicians and one of our gastroenterologists. The gastroenterologist, without taking any stomach contents or having any test breakfasts, for reasons of his own and that the girl rebelled against such procedure, made a tentative diagnosis of ulcer. During this same lapse of four years, she had been upon a restricted diet, *i.e.*, chiefly liquids and softs.

The *x*-ray was called in for help and after various exposures with bismuth, etc., it was stated positively by the radiographer that an ulcer of the pylorus existed, owing to the fact that the bubble of air characteristic of ulcer was evidenced at the pylorus. Personally, I was not satisfied with the radiograph and stated very strongly my lack of confidence in the reading of the plates as given by the radiographer. I saw her at the age of eighteen May 5, 1913, the second time in four years, and obtained the preceding history of her hemorrhages and the records of her *x*-ray plates. In addition, Dr. H., her parents and herself stated that all attacks began with nausea, syncope, no fever and no premonitions. The last attack followed a hearty meal.

Pain.—Has had some when she suffers from gas; pain is in the right half of the epigastric and the right hypochondriac regions, and radiates to the shoulder space. I am inclined to believe her statements in reference to pain were due to the apparent importance placed upon this factor by the various physicians examining her, all evidently seeking for pain in the costovertebral angle, the shoulder blade and the epigastric and hypochondriac zones. The pains she complained of were not relieved by food intake.

Palpation evinced a tender area over the gall-bladder and also over the appendix. It was finally concluded by all of us that an exploration of the abdomen be made. This was done by me on the twelfth day of May, 1913, with most unexpected findings.

Upon exposing the contents of the upper abdomen, the gall-bladder, etc., were found free from adhesions. No evidences of recent or old ulcer of the pylorus or stomach. The pylorus readily admitted a finger. Palpating the stomach in the cardiac portion, the examining hand came in contact with a tumor the size of a small egg, and felt as though it was at the cardia. More painstaking examination showed this to be so. The index- and ring fingers of the left hand were slipped around the cardia with the stomach below and the diaphragm above the hand; the thumb then pushing down readily outlined the position and size of the growth. This growth was now taken to be, in all probability, a large indurated ulcer of this region. Malignancy was not considered a factor of weight, owing to the duration of this disease, yet feeling that an error might be more than possible, I did a gastrostomy, retaining my exploring hand still in the above-described position. As soon as the gastrostomy wound was drawn apart, and the stomach wiped dry, it was seen that a tumor presented at the cardia. This tumor so resembled a large prostate, that I was led to speak of it as prostate in the stomach.

A stomach tube was passed by the anesthetist and passed into the stomach just as the catheter does in a prostate, *i.e.*, the growth surrounded the cardia to within 1/6 or 1/5 of its circumference, stood up as a large two-lobed prostate. At one spot there was an abrasion of mucous membrane and the mass appeared white and glistening in this area. I then pushed the growth strongly into the cavity of the stomach by means of the fingers about the cardiac orifice, and with a blunt scissors tore through the mucous membrane and was able to enucleate the growth with greater ease than one does the prostate. Two small vessels were ligated, the gastrostomy wound sutured, after a careful, but negative, ocular and digital inspection of the mucous membrane had been made.

The abdomen was closed with a small drain. The stomach tube was left in as I felt that the torn mucous membrane might act as an obstruction flap to feeding. This was a fallacious tenet, as the tube was ejected during recovery from narcosis, and the swallowing of liquids the following day was accomplished without pain or difficulty.

A speedy recovery was made, the patient being removed to her home on or about the tenth day. There have been no further bleedings to date.

This type of tumor of the stomach is exceedingly rare, at least as far as the published records show.

Stengel (*Trans. Pathol. Soc.* Phil. 1893–95–1896, xvii, p. 50) reports: This specimen of fibroma of the stomach was removed on autopsy in a patient in whom gastric symptoms had not been striking. The tumor was on the outer wall, subserous, about the size of a walnut, and firmly attached. He called attention to the absence of muscle fibers, although the tumors in this situation are usually myomata or myofibroma. The tumor appeared to be a pure fibroma.

Spencer, W. G. (Benign tumors, fibroma, myoma, lipoma incapsulated in the wall of the stomach; *Proceedings Royal Soc. Med.* London, 1908–09–11, Surgical Section, p. 311) records the history of a hospital nurse forty-six, who had suffered from abdominal trouble some time, from whom he removed from the posterior wall of the stomach a solid elastic tumor which shelled out easily and without hemorrhage. The growth was the size and shape of a large kidney, and on section was shown to be a dense fibroma.

60 West Fifty-second Street.

SOME INTERESTING POINTS ON GALL-STONE SURGERY WITH REPORT OF CASES.[1]

BY
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GALL-STONE disease is one of the most common ailments. Nearly 50 per cent. of the people living to be fifty years of age are more or less affected. It is three times more frequent in women than in men, and very rare under twenty years of age, becoming relatively more common in advanced life. Of women whc have had this disease, about 90 per cent. have had children. This is difficult of explanation. Badly fitting corsets, relaxed abdominal walls, constipation and overfeeding are probably factors.

"In Japan, in 8406 necropsies, Miyake found gall-stones in 3.05 per cent., less than half as often as in Europe and America. The sexes were about evenly affected. This, he thinks, is because Japanese women do not wear corsets. Cholesterin stones are very uncommon in Japan, which can probably be accounted for by the difference in diet."[2]

This can hardly be the true explanation, as it has been shown by careful experiments that cholesterin is formed from the mucous membrane of the gall-bladder during inflammatory changes; hence, it would appear that gall-bladder catarrh must be less common among Japanese women.

Location.—In nearly all cases the stones originate in the gall-bladder, they migrate frequently to the cystic, the common, or even to the hepatic duct; very rarely are they formed in the ducts.

Production.—The bile is normally sterile, though examination of very large quantities may show an occasional germ; these, however, are nonactive and of no importance. During the chronic inflammatory processes, which are always associated with the formation of gall-stones, bacteria are constantly found. Nearly all the pathogenic varieties have been reported, but the more common are the bacillus of typhoid fever and the colon bacillus. These often remain in the gall-bladder for long periods of time. Bacillus of typhoid fever has been demonstrated in Dr. Welch's laboratory seven years after the attack. The principal constituents of gall-stones, bilirubin, calcium and cholesterin, are produced from the mucous membrane of the inflamed gall-bladder; interference with the proper drainage of the gall-bladder is one of the essential factors in the etiology of this disease; frequently foreign bodies, or clumps of bacteria, are found to be a nucleus of gall-stone. The following facts may be considered as having been demonstrated by experimental studies:

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

[2] *Archiv für klinisch Chirurgie*, Berlin, April 26, page 1332.

First.—The injection of virulent cultures of microorganisms cause acute cholecystitis without gall-stone production.

Second.—Introduction of attenuated cultures, or of foreign bodies, produces no effect if the drainage is normal.

Third.—The introduction of nonsterile bodies, or of attenuated cultures of bacteria into a gall-bladder in which the drainage is interfered with, will cause the production of gall-stones.

Bearing on the question of foreign bodies in the gall-bladder, as well as the treatment of this disease, is a most interesting series of experiments by Hansemann. He placed a number of human gall-stones in the bladders of healthy dogs. Later examination showed the stones partly, or completely, dissolved. In no case did they cause trouble.[1]

The following cases are taken from my service at the Franklin Square Hospital of Baltimore during the past two years. I have selected those which seemed to illustrate and emphasize certain points to which I wish to call your attention.

CASE I.—Mrs. L. Z., white, female, aged thirty, married, mother of several children. She had been suffering several weeks with a typical case of typhoid fever. As the patient failed to improve at the usual time, instead becoming weaker and suffering much distress in the liver region, her physician suspected gall-bladder complication and brought her to the Franklin Square Hospital July 12, 1911. Operation July 13, 11.35 A. M. Gall-bladder enormously distended, pale, walls greatly thickened, filled with thick creamy pus containing several medium-sized stones. After excising the gall-bladder, two stones were found in the common duct and were removed through the open cystic duct by compression. This patient made an uneventful recovery.

CASE II.—Miss K., white, female, aged twenty-four, unmarried, admitted May 6, 1913. As this patient's condition was very desperate, operation was done the same afternoon. She had been very ill for more than six weeks when she came under my care. Incision showed a gall-bladder gangrenous throughout its entire extent, and filled with gall-stones and pus; around the bladder was an imperfectly walled cavity containing a large quantity of foul pus; the gall-

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[1] Die Lösungsmöglichkeit der Gallensteine, v. Hansemann.

bladder was removed, the cavity cleaned out and freely drained. About a week later a second abscess formed in the lower right abdominal segment; this was also drained; symptoms of partial intestinal obstruction, due to the extensive adhesions present before the operation, were only partially relieved; fecal fistula formed several days after operation. The patient succumbed on June 16, to long-continued suppuration and inanition.

Case III.—Mrs. Z., white, female, aged twenty-two, mother of two children. She had an umbilical hernia and had suffered with attacks of intestinal obstruction from bowel being caught in same. On the night of May 13, 1913, she was seized with severe pain in the upper abdomen. Her physician, who is a very careful and expert diagnostician, was much puzzled as to the cause of her illness. She had vomiting and symptoms of partial intestinal obstruction with rapid pulse and normal temperature. I saw her on the night of the 14th at her home. At that time her temperature had not been over 99°, pulse about 100 and weak; she had very great tenderness over the upper abdomen with pain; altogether, her condition was distressing and much graver than her pulse and temperature would indicate. She was sent to the hospital on the morning of the 15th and operated on at 1 P. M. Her temperature was 99.4°, pulse 100, when she entered the hospital; no positive diagnosis was made before operation; the question of acute cholecystitis was considered but, after careful questioning, we could get no history of gall-bladder trouble, and as her temperature had been normal with only very slight rise when she was removed from her home to the hospital, less than one degree, its presence was considered very doubtful. Incision revealed a very large gall-bladder filled with pus and stones. Cholecystectomy was followed by rapid convalescence.

Case IV.—Mrs. D. B., white, female, aged forty-three, married, no children, wife of a physician; had suffered for many years with gall-bladder disease, many of the attacks being very severe and associated with high fever and symptoms of severe inflammation. She had been very ill for more than a week before entering the hospital on August 22, 1912. At this time her pulse and temperature were nearly normal and her inflammatory symptoms had subsided to a great extent, but there was still marked tenderness over the gall-bladder region. Operation August 23, 11.40 A. M. The patient's abdomen was very thick; the gall-bladder was exposed with some difficulty; it was much enlarged; contained pus and several gall-stones; the walls were greatly thickened and extremely friable, so that dissection was almost impossible; forceps and ligatures would tear through; hemorrhage was controlled with much difficulty on this account. After removing the major part of the viscus, because of severe bleeding it was necessary to clamp the stump with a large pair of forceps and leave them *in situ*. This patient did very well, except that a fistulous opening persisted and, on November 14, 1912, she reentered the hospital and was operated upon at 1.30 P. M. On dilating the fistulous opening a large stone was found. The incision was extended and the whole mass consisted of gall-bladder wall and the beginning of the cystic duct was removed; a drainage tube was tied in and packed around with cigarette drain. She left the hospital November 27; drainage soon stopped and she has remained well since.

Case V.—W. D., male, white, aged twenty-nine; entered hospital January 2, 1913, discharged February 27, 1913. This patient had suffered with symptoms of gall-bladder obstruction and cholescystitis for the past two years, the attacks occurring about twice a month and continuing for nearly a week, so that he has lost almost half his time from work during this period. The colicky pains in this case have always been extremely severe and long-continued, so that large doses of morphine have been necessary to give relief; his temperature, usually, has been very slightly elevated. Operation January 26 at 8.20 A. M. On opening the abdomen a large, thick and dark gall-bladder made its appearance; palpation failed to reveal stone either in the gall-bladder or in the ducts. A well-marked cicatricial band was found across the first part of the cystic duct; gall-bladder was removed and found to contain a large quantity of thick dark bile mixed with mucus, which was very viscid. From the inside the cystic duct was found to be greatly constricted by the cicatrix. This patient made a normal recovery and remains entirely well.

Case VI.—Mary C., white, aged sixty-eight, married, mother of several children, entered the hospital January 16, 1913; operation January 18, 1913. The patient was extremely ill with symptoms of acute cholecystitis following long-continued gall-bladder disease. An exploratory incision was made and acute suppurative inflammation of the gall-bladder and surrounding tissues together with extensive malignant infiltration involving the gall-bladder and adjacent parts of the liver, was found. The patient's condition was very alarming under the anesthetic, so that a drain was very rapidly introduced and she was removed from the operating table. She died on the next day at 9.45 A. M.

Case VII.—Mrs. J. C., white, female, married, aged sixty, mother of several children, entered Franklin Square Hospital May 23, 1913, operated upon May 24, 1913, 8.30 A. M. This patient suffered with gall-stone colic for many years during her early life. The disease was not diagnosticated at the time, but the history is perfectly typical. For the past twenty-five years she has had much less trouble until the beginning of the present attack about six months ago. Her sickness began with symptons of indigestion associated with distress in the epigastrium and right hypochondriac region. In spite of all possible treatment, her disease became gradually worse and, after much persuasion, she consented to have an operation done. She had had no elevation of temperature and no marked symptoms of obstruction; the pain was not so much a colic as a sense of great distress in the region of the gall-bladder radiating to the back and right shoulder. The diagnosis was gall-bladder disease with strong suspicion of carcinoma. The operation revealed carcinomatous infiltration of gall-bladder and surrounding parts, including the liver, the duodenum and the colon. A great deal of fluid escaped from the upper part of the peritoneal cavity; drainage was established and the patient's pain much relieved. She returned to her home and died about two months after the operation.

Case I shows the importance of watching the gall-bladder during the progress of typhoid fever; and her rapid improvement after excision of the gall-bladder shows the value of radical measures in such complications.

The desperate condition of Case II was due to long delay. Could her obstruction have been removed, I think she might have been cured.

Case III was most interesting, as well as puzzling. The patient was very ill and prostrated from toxic symptoms, and yet had a normal temperature. Blood count might have helped in the diagnosis, but she was so ill that we were afraid to wait for it.

The operation in Case IV was most desperate. The patient's husband was present. Every ligature applied cut through; the hemorrhage was alarming and I was thankful to control it by the method described. I have seen similar conditions during operation on the appendix, done while the organ was recovering from a severe inflammation. Had we waited until the attack had entirely subsided the difficulties would not have been met and the second operation would have been unnecessary. No operation should be done at this period, of an acute cholecystitis.

Case V, stricture of the cystic duct, in which the symptoms were entirely different from any other case that I have met with, partial obstruction of this duct was predicted by the family physician.

Cases VI and VII show the danger of long continued gall-stone disease as predisposing to carcinoma.

The above cases all demanded cholecystectomy. In cases where the gall-bladder was not hopelessly diseased, and where there was no stricture, I have done cholecystostomy. These cases have recovered and usually have remained well. One of my cases had a fistula of long duration which failed to yield to the usual treatment. She fell into the hands of another physician who closed the fistula with electro-cautery. I found the same thing effectual in another case after other methods had failed.

I am persuaded that the gall-bladder will be removed more frequently in the future. The Mayos, on account of their enormous experiences and wonderful success in these conditions, have done much toward making cholecystostomy the operation of choice. They point to the slightly greater mortality of cholecystectomy. This may be accounted for by the graver conditions in which it has been done. They also point out that the gall-bladder is too small to act as a reservoir, but that probably its function is to relieve tension during the height of liver secretion, and thus to prevent regurgitation of bile into the pancreatic duct. This is an ingenious theory; yet many animals get on without this organ. Is it not more probable that the small inadequate gall-bladder of man, with its poorly developed coats, is a disappearing organ, physiologically as well as pathologically, very like the appendix?

DISCUSSION ON THE PAPERS OF DRS. KIRCHNER, PANTZER, KEEFE, ERDMANN, AND BRANHAM.

Dr. Charles N. Smith, Toledo.—I shall confine my discussion very largely to the paper of Dr. Keefe, but first, I will speak for a moment concerning a remark made by Dr. Branham in which he states that the typhoid bacillus has been recovered from the gall-bladder in one instance in Welch's laboratory seven years after an attack of typhoid fever. The literature of gall-bladder infections show that there are many cases where the typhoid bacillus has been recovered from the gall-bladder in seven, ten and fifteen, or even seventeen years after. In fact, at the Syracuse meeting of this association some of you may recall I reported a case on which I operated seventeen years after an attack of typhoid fever, the patient being a man, who during the seventeen years was a semi-invalid with great loss of flesh and strength, who had suffered many repeated rather long-continued severe attacks of diarrhea, associated with adbominal pain and temperature. I drained his gall-bladder for a period of thirteen weeks. The man went home and within a year following operation gained 36 pounds in weight and became strong and hearty.

As regards infantile pyloric stenosis, I think there are few conditions in surgery which require greater judgment and in some instances greater courage in determining when and what to do. The patient is of necessity notoriously a bad surgical risk. Even when they are seen early, there are so many of these cases recovering under medical treatment, so-called, that is under gastric lavage with alkalies, that one hesitates somewhat in deciding upon operative procedures at once, and yet if one delays too long and keeps up lavage and allows the patient to starve still more, he loses what opportunity he has for operative success, so that it requires great judgment and in certain instances considerable courage to undertake an operative procedure.

From my own experience, which has been rather small, and from that which I have seen in the practice of other men and the cases which I have studied in the literature, it occurs to me that in this condition, as in many other surgical conditions, no one operation will meet the indication best in all cases; that is there are certain cases of infantile pyloric stenosis, which upon exhibition, upon exposure, will lead us to do a gastroenterostomy. Notoriously those cases with a discernible or demonstrable tumor, with a thick wall, can be best operated on by a gastroenterostomy because the one thing which is of greatest importance in this operation is the element of time. The operation which can be done the quickest must be done, and I believe the average surgeon can do a gastroenterostomy quicker than he can do a pyloroplasty, the dissection of new growth or piled up tissue, and dilation through an artificial opening into the stomach, with closure of the artificial opening and the closure of the pyloroplasty incision. In some instances, however, where the pylorus is not so greatly thickened, I believe a pyloroplasty, either the Heinecke-Mikulicz pyloroplasty, or the one suggested by Dr. Keefe, can be done in a shorter time than gastroenterostomy, and in those cases I certainly should employ the method of Dr. Keefe, although I have never as yet done so. I do not believe the implied statement of Dr. Keefe, that these cases should be operated upon by any one except a skilled abdominal surgeon. These are operations which require dexterity and speed but there is no necessity for making an emergency operation in these cases, because everyone of them has been subjected or should be subjected to a certain amount of so-called medical treatment, lavage, etc., before operative procedure is determined upon, and when operative procedure is determined upon, a few hours delay will have no effect upon the mortality.

Dr. Hugo O. Pantzer, Indianapolis.—With reference to the cases reported by Dr. Keefe: I have not had a case in my practice. I wish to congratulate Dr. Keefe upon his procedure. Its simplicity commends itself and makes it applicable to many cases. The results following this procedure should be carefully reported for further consideration. Personally, I am prepared to do a different operation, one that I performed some ten or fifteen years ago in a case of benign stenosis of the stomach. After I had reported my case I found the operation had been suggested by another surgeon. The operation simply consists of cutting off the duodenum and implanting it into the anterior surface of the stomach. A transverse incision through the hypertrophic transverse muscular fibers, prevents spasm of the pylorus and it affords a good ostium. The pyloric end, where the duodenum has been detached, is permanently closed.

Regarding the cases reported by Dr. Branham, they are interesting, but I doubt whether we have good reason, except in the rarest instances, to remove the gall-bladder. Reference is often made to stenosis of the cystic duct owing to cicatricial changes in the mucosa. There is not an organ in the body more capable of regeneration than the mucosa, and from my own experience, I would not do a cholecystectomy except in rarest instance.

Dr. H. W. Longyear, Detroit.—There is only one phase of these papers that I wish to discuss, which is in connection with the cases reported by Dr. Branham concerning infection of the gall-bladder. I believe it is very difficult in some cases of infection to cure them by drainage. I have in mind the case of the late General R. A. Alger, about whom some of you knew at the time. In that case the infection was due to the colon bacillus, and I kept a drainage tube in for a number of months. I experimented with different chemicals to relieve the condition by sterilizing the bile, but found it impossible to do so. Chemicals were used that would kill the colon bacillus and that were well borne by the patient. Drainage was free into the bowel, yet in twenty-four hours after using the antiseptic lavage, the colon bacillus would be present in the bile the same as usual; and even after several consecutive days of doing this, it would still be in evidence, showing apparently the presence of the continued infectious tract reached by the lavage, viz.: in the hepatic ducts.

I think in cases of infection by the typhoid bacillus we have a very excellent remedy in urotropin. That opinion is the result of the experience I have had. It has proved to be a valuable agent not only in the infection of the gall-bladder, but in other infected areas, especially in the kidney, following typhoid fever, where the bacillus has been found. I have found it extremely useful in those cases. I speak also from a personal experience of my own case. I had typhoid fever and following it hemorrhage from the kidney and suppuration which lasted for fifteen years. I tried all sorts of medication for years without avail, and at last used urotropin, taking 30 grains a day, and the suppuration ceased inside of ten days. The irritation from this had become so incessant that it was reducing me very much; it made me anemic, gave me all kinds of trouble, and gradually reduced the capacity of the bladder to three ounces, the relief from which one cannot appreciate unless he has passed through it. So I do believe in that one remedy we have something that we can depend upon in medicine for this one thing, and that is infection from the typhoid bacillus.

Dr. J. H. Carstens, Detroit.—Dr. Kirchner has had a very good and interesting experience. We treat the cases he has reported in the same general way.

So far as Dr. Keefe's paper is concerned, I never saw a case such as he has reported. If I encountered such cases I do not know whether I could persuade the parents of the children to consent to operation.

Before discussing Dr. Branham's paper, I wish to say that urotropin is eliminated by the gall-bladder and by the kidney. A point I want to make is this: sometimes when the gall-bladder is infected very seriously, and you think you can jog along, you can disinfect the gall-bladder by giving the patient urotropin a week or two, and get the gall-bladder in a reasonably healthy condition, whereas if you should operate immediately you would kill the patient.

I always make a transverse incision in the direction of the external oblique and separate the fibers, and then I make the incision straight along the fibers of the external rectus, and when I get through that, then I lift up the peritoneum and transversalis fascia, and make an opening so that I can stick my finger in it, and feel if there are any gall-stones in the gall duct. If not, I pull the gall-bladder up in the little opening, and with a fine suture sew it all around to the peritoneum; I open the gall-bladder and wash out the gall-stones, and by so doing, cannot get any infection in the peritoneal cavity.

Dr. Branham, like the rest of you, whenever you talk about gall-stones, will tell you about the wonderful postmortems made in Germany and by this man in Philadelphia who found 15 per cent. of cases of gall-stones in patients. I have talked about this before. I have made observations on living subjects; I have operated for fibroid tumors, I have operated for ovarian tumors, and for many other pathological conditions, and when I heard wonderful stories of so many people having gall-stones, I made up my mind I would investigate every case I operated on; that I would explore the gall-bladder and keep track of it, and when I have a patient come to me I inquire with reference to symptoms referable to the gall-bladder, whether or not he or she has had any gall-bladder trouble, and so when I operate for fibroid tumors and other conditions I explore the gall-bladder. I have done that 500 times, and how many gall-stones do you think I found? I found two in the living subjects, and so I for one do not believe that so many women have gall-stones. I hold that gall-stones are not common as a general rule, and people who have gall-stones have more or less symptoms, *and gall-stones present a more or less serious condition which sooner or later will cause trouble.*

Dr. Roland E. Skeel, Cleveland.—I shall await anxiously the publication of Dr. Kirchner's paper in full so that I may be able to read it deliberately because I think his is a subject that is as important as any that has been brought to our attention at this meeting. I am quite interested in what he said about, and the emphasis he laid upon, the importance of tympany as a cause of obstruction; distention of the bowel with flatus above a simple kink tremendously aggravates the original cause and may act to produce complete obstruction. These cases of interval obstruction come to us too late, and the reason they come too late while obstruction from strangulated hernia comes early, is because of lack of diagnosis in the former, the original practitioner giving the patient a cathartic, the violent symptoms of obstruction manifesting themselves only after this, because of violent peristalsis with enormous filling of the gut above the kink thus producing a tighter obstruction than originally. That leads to another thought which is that many cases of postoperative obstruction are due to the same thing, viz., catharsis. We can assume that after every abdominal operation there will be some adhesions, and therefore will be some kinking of the gut and if, for illustration, the patient is given a dose of calomel followed by the administration of a large dose of salts; tympany will be produced when if a kink occurs, dilatation of the gut above this will cause more and more kinking and angulation until the patient has complete obstruction. So there are two lessons which Dr. Kirchner has brought out.

In referring to the case of fibroma of the stomach reported by myself last year Dr. Erdmann mentioned the fact that the specimen was not examined pathologically, although macroscopically it was myoma. Incidentally this brings up the curious way in which men of perhaps limited experience in a given line may nevertheless see three or four unique cases in a very short time. Just before leaving home I removed another benign tumor from the stomach, although my experience in the surgery of the stomach is very modest compared to Dr. Erdmann's. Sections were sent to the pathologist for microscopic examination and the report subsequently received stated it was a papilloma although I had never before seen or heard of a papilloma of the stomach. This particular case was diagnosticated previously as a carcinoma and hopelessly inoperable.

Dr. Frank D. Gray, Jersey City.—I can hardly resist the temptation to say a few words upon the paper of Dr. Kirchner, as it is a subject which interests me very much. In line with a remark made by Dr. Skeele, it sometimes happens that one with a very modest experience will get a run of a particular class of cases within a comparatively short time. For instance, it has been my fortune to have had twenty-eight cases of intestinal obstruction in the last three years, and that experience has impressed me with the fact that intestinal obstruction is one of the tragedies of surgery. The way to avoid the tragedy is to educate. We talk about dealing with the problem of carcinoma by educating the public; I think we should deal with the problem of intestinal obstruction not by educating the public, because it would not do any good, as these cases are usually sudden occurrences, but by educating the general profession to recognize these cases quickly.

Dr. Kirchner made a very important point when he said that the early symptoms are the important ones. We find practitioners so many times waiting for a typical picture of intestinal obstruction, not only for persistent and constant vomiting, but they wait for stercoraceous vomiting, and by the time they get it the case is too late.

The tremendous tragedy of this subject is illustrated by some remarks I heard Bloodgood make a year ago at a meeting of our state medical association. He said that in twenty-one years' experience in the Johns Hopkins Hospital there were 320 cases of intestinal obstruction, an average of fifteen per year, with a mortality ranging year by year from 40 to 100 per cent. Dr. Kirchner is beating him out by 50 per cent. in some years, in that his mortality has been much lower, and I attribute it almost entirely to his getting these cases earlier.

There is one practical point I would like to emphasize and that is every case of suspected intestinal obstruction is entitled to a rectal examination. In the older patients we may find malignancy which should be attacked from below instead of through the abdomen. In some cases we may find what a colleague of mine found in a certain case. After opening the abdomen he discovered only a sodden mass in the rectum which he dug out after he had closed the abdominal incision. It was a case of fecal impaction in the rectum, and he did an unnecessary laparotomy.

One more thing that is of importance is the causes of death in intestinal obstruction. There has been a great deal of argument pro and con in regard to the causes of death, death in some cases being attributed to toxemia, in others to shock, and in still others to the loss of body fluids, I am inclined to think you cannot charge the cause of death up to any one of these conditions alone. I am sure, in one of my cases death was due to shock because there was no loss of body fluids; the patient only vomited two or three times, and died promptly within an hour after a simple operation for relieving intestinal adhesions in fact shock had developed two hours before operation and never abated. The point was made by Hartwell two years ago that most of these patients died from loss of body fluids, due to vomiting, which gives us a clue to one kind of treatment. We should replace the body fluids by proctoclysis or by intravenous transfusion. We replace in that way what the patient has been losing.

In regard to the technic and the number of cases in which resection was made in these series; in a good proportion of cases we have to do resection, and I think the method of resection is an important matter. To my mind an admirable method of end-to-end anastomosis has been neglected for twenty years. I refer to the old Maunsell method, which enables us to invaginate the two ends through a split in the divided intestine, and to make the junction with a single row of sutures but not as Maunsell did. He used interrupted sutures, and it was a weak point in his technic which allowed the inverted ends of intestines to slip and cause a leakage. We should do a continuous end-to-end interlocking suture. It is a quick operation. I have used it in eight or ten cases and in two cases in particular, where it would have been difficult to resort to any other method in the lower sigmoid.

Dr. Thomas B. Noble, Indianapolis.—Just a word relative to gall-bladder disease and gall-stones. Recently I encountered a case which I feel proves that gall-stones can be developed outside the gall-bladder. This was a case in which two stones were found in the common duct, and no gall-bladder at all could be observed by palpation and inspection of the perfectly smooth, nonadherent hepatic surface. Covering the two hands with gauze and pulling the lower aspect of the liver upward and the gastrocolic ligament downward, making those tissues taut, I could see underneath the hepatic substance at the hilum of the liver a whitish body which, when I split the tissues overlying revealed the hidden gall-bladder, which was entirely an intrahepatic viscus. It required cutting of the liver substance upward from the hilum of the liver for a distance of 3 inches, and I dissected out then a shriveled rudimentary gall-bladder which had a cavity which when opened was found to be perfectly dry and void of mucus or bile. I am quite certain this viscus never held these two stones which we found in the common duct.

This year I have been following the plan of making a diagonal incision, splitting the fibers of the external oblique, and, if necessary, cutting through the fibers of the rectus, and I have been so well pleased with the results I have had I have selected it over others that have been made. It gives one free access to the pathology that here obtains, whether it be relative to the pylorus or duodenum, bladder or gall ducts, or to the kidney. The incision advised by Dr. Carstens I could not feel myself personally satisfied with. I could not myself feel assured that I had discovered the stones which might be hidden in the hepatic duct, or that might be in the common duct, nor could I be certain of any possible pathology that might exist in the pylorus or in the duodenum, which I might have mistaken in my diagnosis before operation and have overlooked by such a meager opening. Maybe I am wrong, but I do not look with such fear upon the dangers from infection in this region. It may be hazardous, but my experience has not been such as to lead me to become fearful relative to making a wide exposure of this very important region. I think incisions here should be sufficiently large to inspect the stomach and the viscera lying co-adjacent to the pylorus because of their very great important surgical character, and I believe that if Dr. Carstens who is known so widely as a very efficient teacher, a man of wide experience and good judgment, advocates such an incision as this, the younger men will be misguided as they have been misguided to my positive knowledge as to the pathology that lies underneath the border of the right ribs. Recently I have had to remove the gall-bladder on two occasions where younger men have by a small opening opened up here and removed stones from the gall-bladder, leaving a small incarcerated stone in the cystic duct which kept up a persistent mucous fistula. These mistakes could have been avoided by a larger opening and a more careful examination of the organs.

Dr. Kirchner (closing).—I had two motives in bringing this subject before the members of the association. One was to call attention to the various conditions which might underlie obstruction, and the other was especially to emphasize the need for early diagnosis.

Dr. Carstens says he does not meet with these cases so frequently, but in other hospitals postoperative obstructions are quite frequent, and the symptomatology should be borne in mind so that the cases of that nature may be early recognized.

I have found that patients suffering with symptoms of obstruction, as is often the case in strangulated hernia and also in other conditions, by the time they reach the hospital, have often been given cathartics. If pain is present, they are frequently given morphia, and cathartics and morphia have done more to help kill patients with intestinal obstruction than anything else.

The point made by Dr. Gray in regard to rectal examination I brought out in my paper. I have witnessed a laparotomy for obstruction similar to the one mentioned, in which a syphilitic stricture of the rectum was found, and the condition could have been relieved easily by dilatation from below. So a rectal examination should always be made.

I do not believe the subject as to the causes of death has been thoroughly worked over. There are probably a number of factors that bring about fatal results. There is doubt in my mind that toxemia is a potent cause. Given a case of obstruction, with the accumulation of fecal material, which, as the obstruction and condition advances, becomes liquid and greenish, we have there a fluid which is intensely toxic. I believe this condition is, at least, one factor in the cause of these deaths and this toxic fluid explains, perhaps, certain deaths that follow apparently good surgical work. Let us take, for instance, a case such as I had, the first one, where apparently the surgery was well done. There was a distended and disorganized bowel containing liquid fecal matter and gas proximal to the constriction, but the bowel below retained the healthy mucosa. Here we had a distended bowel containing an intensely toxic material which after the surgical repair was allowed to flow over healthy and absorbing bowel mucosa. I believe that in certain instances, this toxic material is the cause of death. Furthermore, shock is undoubtedly a factor in many cases. The loss of body fluids through drainage into the intestine and also from emesis, is also important.

Again, many of these patients are intensely anemic, and it is thought by some that as a result of the toxemia and intestinal conditions, that the intestinal veins become dilated and you have so to say, a bleeding into the abdominal veins and consequent anemia. There are, therefore, many things to be considered, which are likely to cause death.

Dr. Keefe (closing the discussion on his part).—If I understood my friend, Dr. Skeel, he seems to feel that gastroenterostomy can be done more rapidly than a pyloroplasty. A pyloroplasty can be done more easily than a gastroenterostomy. We must remember that a gastroenterostomy in an adult is a comparatively simple operation, but here we have to do with an emaciated infant, weighing sometimes not more than from 6 to 8 pounds. As no food is passed into the intestine we find it collapsed. The intestine is scarcely as large as my little finger, and we have a different proposition to deal with from what we have in the adult. Then he also stated we may do a pyloroplasty in some instances depending upon the size of the pyloric tumor. The size of the tumor varies very little. It seems to me, we should not base our operation upon that one factor. If the patient requires a rapid operation, we might omit making an incision in the stomach and do the pyloroplasty alone, and that to my mind could be done in one-quarter of the time that a man would take to do a gastroenterostomy.

Dr. Branham (closing the discussion).—The case related by Dr. Erdmann brings to my mind a very interesting one I operated on some time ago, in which I removed the pyloric end of the stomach for annular growth, one which did not extend entirely around the pylorus but had considerable thickness. The nature of this growth was afterward the cause of a good deal of discussion. It was examined by a competent pathologist who pronounced it carcinoma; another pathologist looked at it and said it was aberrant pancreatic tissue. To settle the matter we got Dr. Welch to go over this specimen and he pronounced the case one of carcinoma and aberrant pancreatic tissue, saying that both of these gentlemen were right. He said it was undoubtedly a case of aberrant pancreas which had unquestionably malignant degeneration. This patient I operated on about thirteen years ago, and he is still all right.

In reference to the cases reported by Dr. Keefe, he undoubtedly does the best operation in those cases. I feel it is the simplest and most likely method to be successful.

I would like to ask Dr. Carstens if he passed his hand and forearm into the abdomen in all of the 500 cases of which he speaks.

Dr. Carstens.—In those where I made a large incision?

Dr. Branham.—Yes.

Dr. Carstens.—I did.

Dr. Branham.—The question of frequency of gall-stones I feel has been unquestionably settled contrary to the experience of Dr. Carstens. He has either had peculiar cases or has seen very few gall-stones. There is no one who has greater respect for Dr. Carstens' ability than I have, but he is enthusiastic. He is unquestionably wrong this time.

Dr. Carstens.—My contention is that there are not so many cases of gall-stones as we have been led to believe.

Dr. Branham.—As to the proper operation in these cases, we all know the Mayo Brothers have done great work, and probably more work and better work in this line than anybody else. They believe in cholecystostomy, as a rule, yet they give us certain statistics which would indicate very forcibly that cholecystectomy ought to be done in many cases. Their report of the pathological examination of something like 4000 cases—I forget the exact number— shows that in a large number of them there was carcinoma of the gall-bladder, these gall-bladders having been removed for other causes, and these patients have nearly all remained well. Where a carcinoma of the gall-bladder was sufficiently advanced to be diagnosed and an operation performed at the time, the patients practically all died. These chronic conditions are frequently associated with carcinoma, so that there is a strong indication for removing the gall-bladder if it is badly diseased.

SUDDEN SEVERE HEMORRHAGE INTO AN OVARIAN CYST FOLLOWING DELIVERY.[1]

BY
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It is estimated that of all the neoplasms of the ovary cysts make up 85 to 90 per cent. Boeckel in 1861 explained the formation of menorrhagic cysts by the fact that a Graafian follicle may mature and not rupture. At each menstrual period this is repeated and at each menstrual period one more unruptured follicle is added until the ovary is finally transformed into a mutilocular cyst. Others have adopted this view and have ascribed the small ovarian apoplexies to an unruptured Graafian follicle. The occurrence of small extravasations of blood into the follicle is not at all unusual and is frequently met with. These small hemorrhages have been given the name of "ovarian apoplexies." The influence of menstruation in producing them is probably very small. Daniel thinks it acts by bringing to light preexisting lesions. Smallwood Savage divides ovarian hematoma into two varieties. (1) Hematoma of the Graafian follicle and (2) hematoma of the corpus luteum. In the first the walls of the hematoma are lined with a single layer of epithelium lying on a basement membrane, external to which are two layers which correspond to the theca interna and the theca externa. In the second type, there is a shell of ovarian tissue, the inner wall of which showed newly formed fibrous tissue poor in cells. It has been noted that these small hematomas occur more frequently in association with fibroids than with other pelvic lesions. They may frequently be associated with malignancy of the ovary. In either case they are small and inconsequential and can scarcely be compared with the large and severe hemorrhage that occurred in the case here reported.

Case.—Mrs. Bessie B. aged twenty-four, Russian Jewess, weight 120 pounds, passed through a normal delivery at term in the hands of Dr. Daniel Jenifer. Her father died at the age of fifty-five from heart disease, but her mother is living and well. The patient is a well-developed young woman, well nourished and has had no previous illnesses except a small ischiorectal abscess at some time in the past. She has had two children, no miscarriages, no leukorrhea, sleeps well, appetite and digestion good, bowels regular. Urination normal; has no headaches nor backaches. Menstruation began at the age of thirteen and has been regular and painless and with normal flow. She has not been conscious of any pelvic symptoms before or during her pregnancy.

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

On examination she presents a normal vulva and vaginal outlet, the cervix is softened from the recent pregnancy, but well contracted. The uterus is well contracted, somewhat larger than the fist. On the left side can be palpated a mass about the size of a large cocoanut rising from the pelvis and to the left of the uterus. This is tender on pressure and of somewhat harder consistency than the average ovarian cyst. Heart, lungs and kidneys are normal.

The onset of the trouble was as follows: For four days after delivery, she ran a perfectly normal course without any elevation of temperature or pulse or other symptoms. She was then suddenly seized with an excruciating pain in the lower left inguinal region from which she fainted. Her pulse jumped to 140, temperature dropped to 97°. There were anxious facies, cold clammy skin, air hunger and sighing respiration. Her attendant feared pulmonary embolism or an obscure internal hemorrhage and asked me to see her with him in consultation. After a few hours her pulse had dropped to normal and her temperature had reached 98° under treatment of rest, morphia and ice to the abdomen. By the time I saw her symptoms of obstruction of the bowel had come on. It had been impossible to get a movement after repeated efforts with enemas. She was then vomiting and her pulse had quickened somewhat, being at this time 96, but the temperature was normal. She was immediately removed to the hospital and a laparotomy performed.

On entering the abdomen the uterus was found to be well contracted; the right ovary contained a cyst about the size of a walnut; the appendix was normal but was removed; the left ovary was enlarged to about the size of one's head, dark in appearance and pressing directly upon the sigmoid to such an extent that its lumen was completely constricted. There was no torsion of the pedicle; the cyst was unilocular and filled with dark thick blood. Both ovaries and tubes were removed, and the patient made an uneventful recovery.

The case is an unusual one and the literature is so meager that I have been able to find but two cases similar to this one. At the Atlantic City Hospital laparotomy has been done for the removal of the appendages, by the writer in 291 cases and while the small ovarian apoplexies are frequently met with no case approaching this one has been encountered by myself or by my colleagues on the staff.

A case similar to this one is reported by Dr. W. C. Jones, in *Surgery, Gynecology and Obstetrics*, Jan., 1913, p. 63. The history of his case was briefly as follows: A patient with pregnancy and delivery, apparently entirely normal, within twenty minutes after the end of the second stage showed an abdomen greatly enlarged. The doctor thought he must have overlooked a twin child in the uterus. On examination he found the uterus empty, thus demonstrating that the enlargement was outside of the uterus. There were no symptoms of hemorrhage, no pain, nor any other pathological signs but a pelvic and abdominal enlargement. The enlargement gradually increased and the patient gradually became weaker. A month after the delivery the tumor had increased to nearly twice the size of a normal pregnancy, but with the prominence to the left side. The physical findings were those of an abdominal cyst, but he had some misgivings on account of the strange history. Laparotomy disclosed a large cyst containing about 6 quarts of a chocolate-colored fluid which was evidently hemorrhagic in origin. The cyst was of the multilocular variety.

Jones, search of the literature was thorough and he appends a long bibliography to his article. The only other case he was able to find was one reported by Robert G. LeConte who saw a patient six weeks after a normal labor. After delivery it was noticed that the abdomen remained about as large as it had been previously. Operation revealed a cyst containing nearly 4 gallons of dark-brown fluid. Dr. Cattell, who made the pathological report, said that it was a multilocular cystoma of the ovary. The contents were of a clear grayish red color and weighed over 32 pounds. LeConte seems to assume that the growth took place, gradually, during pregnancy and that there was no particularly sudden enlargement immediately after delivery, as occurred in my case.

Jones ascribes the cause of the hemorrhage into the cystic ovary to be the sudden lessening of the intraabdominal pressure by the delivery of the child. He also thinks that the pressure was, in his case, a factor in stimulating the subsequent rapid increase in size of the cyst. It is rather remarkable that so great a hemorrhage did not produce any of the clinical symptoms of severe hemorrhage, such as occurred in the writer's case. The only explanation of this is that it is probable that the hemorrhage occurring in his case as well as in LeConte's was gradual and slow, or that there were repeated small hemorrhages, while in the writer's case it was sudden, sharp and severe.

The sudden reduction of intracystic tension by the lessening of intraabdominal pressure due to the birth of the child would hardly account for the hemorrhage in the case here reported, which took place four days after the delivery when the uterus was well contracted and when the intraabdominal pressure had to a large extent readjusted itself. The most common cause of hemorrhage into an ovarian cyst is torsion of the pedicle, but this also is ruled out because there was no torsion of the pedicle found.

The signs and symptoms of ovarian hematoma are usually so ambiguous as to cause it to be mistaken often for such conditions as chronic salpingitis, tubal gestation, uterine fibroids and appendicitis. The ovary is enlarged in the smaller hematomas, filled with old altered tarry blood brown in color and of the consistency of syrup, containing a number of brown solid particles from pinhead size to that of a grain of wheat.

In most of the cases pain is the most prominent symptom. The character of the pain varies, but usually there is a sharp sudden attack of pain in the lower abdomen, located on one side or the other, and associated with vomiting, retching and fever. The physical signs vary with the size, thickness of the surrounding wall, and the amount of peritonitis or cellulitis present. The swellings are usually small except in such a case as reported by the writer, and are often movable. The tumors are fragile and easily ruptured in attempts at removal and in most cases the Fallopian tubes are not disordered.

Ovarian tumors of all sorts, and especially cysts, almost always produce serious trouble sooner or later, and especially during pregnancy and the puerperium. The most dangerous period is the puerperium. It is the part of wisdom, therefore, to remove them as soon as they are discovered, if possible.

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DISCUSSION.

Dr. H. W. Longyear, Detroit.—This case reported by the essayist is interesting and points to a pathological condition that we should be on the lookout for. I believe these hemorrhages into ovarian, or parovarian cysts are prone to take place any time during pregnancy. The very condition of pregnancy, with its accelerated blood supply of the uterus, predisposes toward it, and I think that we should be very suspicious of some such thing if a patient who is pregnant has attacks of pain in the pelvis. She should be examined very carefully.

It has been my good fortune to operate on two of these cases within the last year, one of which was an ovarian cyst adherent to the culdesac and posterior uterine wall. An examination was made by her physician because she complained of a number of attacks of sharp pains in the pelvis. He discovered this cyst, which was pressing the pregnant uterus, in the fourth or fifth month, against the pubes. I was called and operated, and found a hemorrhagic cyst of the left ovary. It was so tightly adherent to the uterus that this organ could not rise out of the pelvis, and this had led to the early attacks and threatened abortion. If the uterus could have risen the pain would not have been so severe and she might have gone on to delivery or, on the other hand, great hemorrhage and rapid growth of cyst might have ensued. A larger hemorrhage had taken place and the pain had recently become more severe in character. The cyst was removed, the patient relieved, and the pregnancy continued without accident. She is about to be delivered.

The other case was one of parovarian cyst, the woman having aborted at the fifth month. It was hemorrhagic, and I removed the cyst after she had recovered from the abortion. I also found a similar condition on the right side, although much smaller. I believe the course of pregnancy is interfered with in most of these cases, and they should be detected early when operation is simple and can often be done in the presence of pregnancy without necessarily bringing on abortion.

Dr. Hugo O. Pantzer, Indianapolis.—I had a similar case about 1890. It antedated immediately my going into a specialty. The woman presented herself at my office with a very large ovarian cyst uncomplicated by pregnancy. She went home, taking a street car, and sustained a jar when leaving the street car. I was sent for within an hour or so. I found the patient suffering great pain and collapse. The abdomen was hugely enlarged and there was dulness everywhere. Operation at first was postponed on account of the general condition of the patient. Operation a few days later revealed a torsion of the pedicle and excessive intracystic hemorrhage.

Dr. Thomas B. Noble, Indianapolis.—These cases are of decided interest both in reference to diagnosis and surgical technic. My experience has led me to fear greatly dead blood in these tumors. By that I mean blood which has been poured out into these cysts in such quantity as to make them wholly hemorrhagic, and allow it to remain until the blood has lost its usual physical character and has become thick, tarry, grumous and sticky. Early in our work we were of the opinion that this was innocent material, and there was not the care exercised in the prevention of soiling that we would exercise in ordinary infective cases. In the absence of evidences of infection in the periadjacent tissues, these cases were treated as we would other cases indifferently relative to the protection of the other abdominal viscera. I came to grief in an operation upon a rather prominent woman, who walked into my office with this condition, and was carried out of the hospital in less than forty-eight hours following the operation. In that operation I found that the changes in the blood in the ovarian cavity had softened the ovarian sac or cortex, so that when the abdomen was opened and the mass was about to be removed the sac ruptured and smeared this material through the abdominal cavity. This was cleaned up, wiping it out with moist cloths. My patient died with all the evidences of a violent peritonitis within forty-eight hours.

I have been struck with the toxic character of this material when found in the ovary in cases in which it has existed sufficiently to produce these physical characters in the blood. Since then, these cases have been operated with as much care as if we were operating in the presence of violent pelvic infection, and if perchance there be any soiling the abdomen is thoroughly washed and irrigated and cleansed, and since treating my cases in this way, the sequential reaction has been a great deal less than it was formerly.

I would like to hear an expression of opinion from those of experience relative to the toxicity of old blood in this region.

Dr. Henry S. Lott, Winston, N. C.—Little points of diagnosis are always of interest to me. Dr. Darnall in his paper says the fact that the mother had a nursing babe would have eliminated an ectopic, and it might be of interest here to mention that I removed a four-months, ruptured ectopic gestation from a mother with a nursing babe.

Dr. H. W. Longyear, Detroit.—In regard to the toxicity of old blood in these cases, I have never had the experience that Dr. Noble has had with that condition, and I do not believe that it exists except in very exceptional cases, and I think his case was one of this character. It is possible the cyst may have laid against the rectum and became infected in that way, but I am sure it would be wrong teaching, to go out from this body, that the abdomen must be flushed and carefully cleansed after operations where we find this old thick grumous blood in the abdomen. I think it is harmful to do that. I do not recall a case in which I have had any trouble from sepsis or peritonitis following, that I could possibly attribute to that cause.

Dr. Darnall (closing the discussion).—I am very much obliged to the gentlemen for their interesting discussion. I feel that these cases must be more common than the literature shows. In searching through the literature I could find only two other cases reported; but men of experience must have run across a number of these cases.

As regards dead blood mentioned by Dr. Noble, I quite agree with Dr. Longyear, I do not think the blood itself is toxic. The thing that makes it toxic in a case like this is the same thing that makes it toxic in the old ectopic. If the blood has been lying in the pelvis for several days, it becomes infected with the bacillus coli communis, and may go on to pus degeneration, and we have to open the posterior culdesac and drain it. It is not because of any function of the blood particularly, but the infection is due to lying against infected tissue.

A SEVEN-POUND OVARIAN TUMOR THAT DEVELOPED IN NINE DAYS.[1]

BY
J. H. CARSTENS, M. D.,
Detroit, Mich.

THAT a woman in perfect health should develop a good-sized tumor in nine days seems hardly possible; and, with considerable experience, I have never before seen anything like it; nor can I recall reading of such cases. I have seen a papillomatous cyst develop to a very large size in two or three months, but never a simple cyst. On account of the peculiarity of the case, I thought it might be of interest to report it.

The case is that of Mrs. Z., æt thirty-six, mother of two children, the youngest eight years old. She is about 5 feet 6 inches in height, weighs about 145 pounds, looks the very picture of health, and has always been well. Menstruation perfectly normal; never had any pelvic trouble.

One morning she got up and noticed that her abdomen was unusually large; she took a cathartic without relief, and noticed her abdomen increasing day by day. She consulted a physician, who gave her some medicine, but without apparent relief. It still increased in size; she became very much worried and began to feel sick; loss of appetite, and "kind of feverish," as she expressed it. She came to me just nine days after the onset of the trouble, when I got the above history.

On physical examination I found an intraabdominal enlargement extending from the symphysis pubis to near the umbilicus. When lying on her back it was rounded, dull on percussion and fluctuating; nothing could be felt through the vagina, except that the uterus was apparently, normal. Taking her temperature I found it was 100.5.°

This was a peculiar case. Certainly, it was not a full bladder, as that organ was empty. It was not ascites, as it was fixed, encysted. It was not tubercular peritonitis, as that condition comes on more slowly, and would not be as rounded and fixed, even if encysted. An ovarian tumor is not accompanied by fever, as this was. It could not be an abscess developed in the abdominal walls or anywhere above the bladder, as there would have been some pain, and the onset not sudden. It could not be a malignant growth, as that would develop slower. It could not be an intestinal obstruction or perforation, as there were no symptoms indicating inflammation of the bowels. It could not be pregnancy, as she menstruated regularly, and the uterus was of normal size. All things considered, it was certainly a most peculiar case. It was sudden in its onset, showing a slightly septic condition at the same time. If it had developed in the course of a couple of months, and without fever, the diagnosis would have been simple—a long-pedicled ovarian cyst.

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

In the course of time we all develop a Sherlock Holmes like mind to unravel mysterious cases, and so I decided this woman had developed a simple ovarian tumor which had produced no symptoms, and had filled the pelvic cavity until it had grown so large, that one night it popped up above the rim of the pelvis, and the next morning the patient discovered enlargement.

While the tumor was being forced out of the pelvic cavity, the pedicle became partly twisted, sufficiently so to interfere with the return circulation; as a result some of the veins had ruptured, and there was a gradual filling up of the sac with blood, and an increased flow of serum which, evidently, occurred also during this time. By moving around, attending to her usual work, the pedicle in a few days became still more twisted and finally the circulation was entirely cut off. The tumor then became gangrenous, and the sepsis began to develop just when I first saw her. I explained to her the seriousness of the condition, and the need of prompt interference. She went to the hospital the next day and I operated April 24, 1913. The operation was a simple one, there were a few slight adhesions, but special care was taken when the sac was emptied not to contaminate the peritoneal cavity. The sac contained a dark, grumous fluid, having the odor of decomposition. The sac itself was green in spots, showing the evidence of gangrene. The infection was from the colon bacillus. She made a quick and smooth recovery.

The peculiarity of the case, the sudden onset and rapid growth, make it unique. Hence I thought it was worth while to put the case on record.

620 WOODWORD AVENUE.

APPENDICITIS IN YOUNG WOMEN.

BY

H. S. LOTT, M, D.,

Winston, N. C.

THE removal of an appendix is a very simple matter, but a vent in the abdominal wall of a young woman, and an unwarranted, invasion of her pelvic and abdominal viscera, is a very serious one.

With the light that has been shed upon its pathology, and in the presence of a certain group of symptoms, we feel very sure to-day of the appendix as a focus for attack. The patient has colicky

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

pain, of either sudden or insidious onset, at first diffuse, but gradually localizing in the lower right quadrant, with nausea of sudden onset, and vomiting, which may be projectile, and nearly always a constipated bowel. The nausea and vomiting may not be marked, and the lower bowel may be easily emptied, but this should not mislead us.

This clinical picture portrays a very large percentage of cases of appendicitis in first, or perhaps in second attacks, and these may occur, and subside, without gangrene, or rupture; the addition of such accident making a more typical picture, with its sudden agonizing pain, subnormal temperature, and rapid weakened pulse.

Such cases constitute the rule, and in males a given number of them, with some slight deviations, will be very much alike, but there are exceptions, and these occur most frequently in young women, and it is the exception, with its importance, that I wish to emphasize.

Tubal and ovarian pain is a very common thing, and especially in young women; but when we think of the delicate structure of these organs, and the functions they perform, it is not really so much a cause for surprise.

Let us for a moment consider the tubes and ovaries, and their close relationship to the appendix. Their normal functions, in common with those of the female procreative organs are accomplished in cycles of turgescence, and of retrocession. Like the tidal wave of the ocean, the currents come and go. Furthermore, the muscular fibers entering largely into their structure endow them with expulsive power—recurrent, rhythmic, paroxysmal, and without volition to throw off an additional burden when it has reached the limit of endurance.

The arterial supply to these organs furnishes, "at times" (Deaver) a branch from the ovarian direct to the appendix. In periods of congestion, whether occurring at the height of the menstrual wave, or during the interval of retrocession, this anatomic arrangement of blood supply insures a bond of sympathy between the uterine appendages and the vermiform appendix, which must account in great part for the obscure blend of symptoms, and should put us on our guard in the matter of diagnosis, refinement of which is the acme of professional attainment.

If groups of symptoms in different patients, even with a similar pathology, were always just the same, diagnoses would never be difficult or obscure. But, unfortunately, they are not, and very few cases come up to the text-book standard of symptomatology. In appendicitis, simple however, I really believe that the symptoms come as near to being uniform as in any condition with which we have to deal.

To recapitulate: pain is the most important symptom of all, because its character will shed most light upon the organ, or organs, concerned. It may be of either sudden or gradual onset, often following a hearty meal; at first diffuse, perhaps, but gradually becoming most intense in the lower right quadrant of the abdomen. Continuous, mark you, maybe with slight remissions of severity, but continuous and accompanied with nausea, and often with vomiting.

Now, these two symptoms—pain and nausea—being the cardinal ones which guide us in early cases, before the occurrence of gangrene or perforation (these accidents presenting a picture of their own), let us study them a little, and compare them with the pain and nausea which so frequently accompany disturbance of the procreative organs in young women. This disturbance may be either normal or pathological, but in either case the character of its most prominent symptom is determined by the anatomical structure, and dominant functions, of the organs concerned.

At the menstrual epoch, which means the height of the menstrual wave, and also signifies congestion of the uterus and its appendages, most young women have some pain, and many of them have a great deal, attended with nausea. This pain is not continuous, but, like all pain accompanying expulsive crises on the part of these organs, be it full-term labor, abortion, ectopic gestation, or an effort at expulsion from the uterine cavity of a submucous fibroid or a polypus, it is recurrent, rhythmic, distinctly intermittent and *expulsive*. The nausea also differs somewhat from that of appendicitis, in that it comes just as the pain is at its height, and lasts, perhaps, throughout the interval.

In addition to these distinctive characteristics of the pain and nausea which accompany appendicitis, the "pair of points" of Dr. Robert T. Morris are of much value; his conception of this reflex sympathetic phenomenon being very beautiful, and very practical. Evidence from these "points" is elicited by making deep pressure just to the right, and just to the left, of the umbilicus, over the sympathetic ganglia, which send nerves of communication, both to the pelvic organs, and to the appendix. Pain, produced by pressure on both sides, would indicate that the tubes and ovaries are involved, while if pressure on the left is negative, and pressure on the right is painful, the appendix is most likely the causative focus.

That the appendix should be removed is beyond question. However, during the past few years two notable cases have been under my observation, in which the entire group of symptoms, as a rule dependable, were certainly misleading. The patients were white, unmarried, and sixteen and seventeen years of age respectively. Through recurrent attacks I had watched them closely. The pain seemed to be independent of menstruation; it was on the right side, at the classic point of McBurney, and was accompanied by nausea. They were of constipated habit, and suffered with disturbances of digestion. Feeling pardonably sure of the diagnosis, operation was advised and accepted. In both cases the appendix was free from congestion, and free from constriction of its lumen; of normal size and location, with a normal meso attached. Of course, the organ was removed in each of these cases, but the patients still have pain, in recurrent attacks, in the same location, and are the victims of obstinate constipation.

Thus, with the additional scar tissue, and its possible *reflex neuroses*, even a symptomatic cure was not effected; and to complacently class these two cases among the "exceptions that establish the rule" does not satisfy me at all, for my surgery did not bring relief to my patients; yet I do believe, most emphatically, that a close and careful study of the character of the pain, and of the rationalè, as well as of the physical signs, will help us to a correct diagnosis, which is of prime importance in cases of painful pelvic and abdominal disorders in young women.

In clean cases especially, the method of removal is important; any method must aim at avoidance of raw surfaces for adhesion, and lessening or distorting the lumen of the bowel. The one seeming to me most surgical, because it accomplishes this, and also because it leaves no buried ligature, or "dead stump" for subsequent sloughing, is that of my friend and teacher, Dr. Joseph Price.

The mesoappendix is freed in one tie of medium silk, including the artery, and leaving a generous stump, with one arm of the ligature left long for future use. Now, with the appendix held upright, its base is transfixed on either side, taking two coats of the bowel wall, with two plain sewing needles about No. 8, armed with fine silk. The needles are left "*in situ*," while the appendix is cut off, across the long axis, and flush with the bowel wall, with scissors. Each needle, in turn, is promptly drawn through and a tie is made; this closes the opening in the bowel and the edges of the lines of incision are approximated evenly. A running whip-over stitch is now taken with the upper silk to the lower angle of the removal, and the silk cut off. This can be reinforced, if you please, by a like running stitch made with the remaining lower silk, starting from the lower angle of the incision, folding in the first row, and going just a few stitches beyond the upper tie, where a final tie is made; to one arm of which is fixed the remaining long arm of the mesostump ligature, thus grafting the stump of the mesoappendix comfortably over the site of removal, and leaving no raw surface, no dead space, and no dead ligature or stump for future slough, and effecting the least amount of anatomical distortion to either its lumen, or the arrangement of the muscular fibers which control the peristaltic function of the cecum.

308 Masonic Temple.

DISCUSSION ON THE PAPERS OF DRS. CARSTENS AND LOTT.

Dr. J. H. Carstens, Detroit.—Did you finally get those patients well?

Dr. Lott.—No, sir.

Dr. Frank D. Gray, Jersey City.—I would like to ask the reader of the paper if there was any evidence of Jackson's membrane in the cases he operated on? In so many of these cases we operate for appendicitis and find a normal appendix, but find also that Jackson's membrane is the cause.

Dr. Charles E. Ruth.—A few weeks ago I had a patient come to me that gave a history somewhat similar to that narrated by the doctor in his case. This patient was operated on by another surgeon the year before with absolutely no relief of the symptoms. We made a careful examination of the patient, taking an *x*-ray, and we found that the colon ascended to nearly its normal position on the right side at the hepatic flexure, and then descended to almost the cecum, and from that point there was another acute angulation that passed directly from the cecum to the splenic flexure. It was impossible to get the bismuth to pass the second angulation. I believed from appearances that we had angulation of the colon produced by the so-called Jackson membrane, or that it was due to omental or other adhesion resulting from the previous operation. The patient was vomiting every day and suffered pain more or less constantly. On opening the abdomen we found a band of omentum extending from what should have been the median position of the transverse colon down into the right iliac fossa, and was as large as my finger and binding the transverse colon down into that position, making an acute angulation at the hepatic flexure and another acute angulation of the colon near the cecum. The operation brought complete relief, and the patient has had no vomiting since. I think it simply emphasizes the fact that in these chronic cases we must not get in too big hurry to operate. We must use all the means we can to make a correct diagnosis before we open the abdomen. It is a different thing if there are acute symptoms indicating danger, but when the case is chronic and we have time to work out the diagnosis, we will do these patients a service by so doing, and when the abdomen is opened we should examine for these pathological conditions that may be the important factors, remembering always what Dr. Binnie says, that some of us find the cecum pathological because it is mobile, and some find it pathological because it is fixed, and we have to be careful how much we give way to our preconceived prejudices in those cases of supposed pathology.

Dr. Hugo O. Pantzer, Indianapolis.—I would like to call attention to a symptom or sign in these cases that should be included not only as one of the cardinal symptoms, but one that has precedence over every other symptom. Pain, nausea, abdominal rigidity, pertain to many abdominal conditions in the early stage. We would often be absolutely at sea if we did not have temperature as a differential sign. Oral temperature is no safe guide. The rectal temperature taken at this stage in practically all cases will be found elevated. An elevated rectal temperature is present even when oral is found normal, or even subnormal. Sometimes this difference may be as much as two or three degrees. In gangrenous appendicitis at the early stage, you will commonly find a subnormal temperature by the mouth, and a temperature three, four, or five degrees higher by the rectum. For one who has made active contention for this point, and found little following, it is a matter of greatest gratification to note that the differential temperature is being noted and qualified as an important diagnostic aid by Dr. Lucien Howe, of Buffalo, N. Y., in an article read before the recent meeting of the American Medical Association, entitled, "Temperature of the Conjunctiva."—*Why not* look for differences in temperature varying with the proximity or remoteness to the seat of the inflammation?

Dr. J. H. Carstens, Detroit.—This seems to me to be a case of wrong diagnosis. I think these girls are suffering from dysmenorrhea, not at the menstrual period, but in the interval, what the Germans call "mittelschmerz," and if the doctor had examined the ovaries and tubes, when the opening was made, and felt down in the pelvis he would have found some trouble there. Perhaps there was some ovarian trouble, but I do not believe it. He did not make a vaginal examination because they were virgins. When they were under the anesthetic, if he had made a digital examination I think he would have found the uterus bent over and kinked, and if he had put in a stem pessary his patient would be cured. This could have been done at the same time, the patient would never have been the wiser, and the doctor himself would have been relieved of the idea that she would have to have another kind of operation.

Dr. H. W. Longyear, Detroit.—It occurs to me, this whole question is one of differential diagnosis, and the essayist brings up a very important matter, namely, the differential diagnosis of appendicitis in women as distinguished from that in men, because we have not only the reproductive organs to consider, but we have another condition which was mentioned by one of the speakers, and that is displacement of the colon. I think that is a very important matter to be considered in differential diagnosis, In women we know we have ptosis of the colon very much more frequently than in men. In some cases the cecal end of the colon has dropped so much that the appendix lies behind the uterus. In cases of appendicitis, with such displacement, what is the value of pain at the McBurney point, as a diagnostic symptom? Absolutely none. It is misleading to be guided by pain at McBurney's point in making a diagnosis of appendicitis in women. My idea of the doctor's cases is this: if he had made an x-ray before his operation he would have found that the cecum was very low, and the appendix down in the pelvis, that the pain consequently did not come from the appendix, but it was caused by angulation of the colon, stagnation of its contents and dilatation of the cecum. The pain was cecal. It was in the cecum because the contents of the colon could not be pushed forward and the cecum was in a state of constant dilatation and tension. These are common cases in women and should be considered in this matter of a differential diagnosis of appendicitis.

Dr. Robert T. Morris, New York City.—There is one particular group of cases in which we have fibroid degeneration of the appendix, in which you will find a thickening of the tunica albuginea of the ovary. In these cases you will often find Jackson's membrane, and Lane's kink. We have a group of embryonic defects. Whenever anything is wrong in the whole anatomy of that patient, there is just as likely to be pain in those defective structures as there is in the investing membranes of the brain in the form of headaches. The sympathetic disturbance will give pain in a fibroid appendix, in a sclerotic ovary or in the investing membranes of the brain about equally often, and we have to consider that fact in dealing with defective structures.

Dr. Carstens thinks a stem pessary will straighten the uterus or will cure the flexion. Flexion is like a cough, a sneeze, or any other symptom. Flexion is a symptom and means something else to be looked after. Unless we consider these other things we cannot accomplish much by tinkering with a fibroid appendix, a sclerotic ovary, or flexion of the uterus.

Dr. Thomas B. Noble, Indianapolis.—Dr. Lott has presented a very clear statement of facts. As Dr. Longyear has said, it is a question of differential diagnosis and brings before the observer as wide a field as the subject of headaches. Kepler once said that a woman was a constipated animal with a pain in her side, due to habit, which produces an incompetent dilated colon, with sequential suffering therefrom. Habit is one thing, inheritance another, physical construction another, hypoplasia another, out of which we get lying neurons —nerves that carry false impressions. Out of this vast field we are to analyze actual anatomical defects, as real disease of the appendix and adventitious membrane; ovarian, uterine, colonic angulations; gastric and duodenal ulcers; and other pathological states. There is one thing which has not been mentioned which I feel will account for the symptomatology which has been given, and that is an incompetent and regurgitant ileocecal valve. I do not believe enough attention has been given to this structure. We have heard much about the pyloric sphincter and not enough about the ileocecal valve. The women who lives a sedentary life, and is constricted with a corset, who develops constipation by habit, in time can easily develop a dilatated incompetent caput coli just the same as she can develop a dilated, incompetent heart, and regurgitation in the matter of heart function means stasis. So regurgitation at the head of the colon means stasis of intestinal contents. Stasis in the circulation of the heart produces discomfort and pain. The whole question is one of differential diagnosis and every method of physical diagnosis must be taken into consideration. The rhinologist, the oculist, the *x*-ray man, test meals—everything that we can bring to bear upon these cases to analyze and bring out their physical defects, both general and local, must be brought in, if we are going to make a correct diagnosis and give these patients help.

Dr. H. Wellington Yates, Detroit.—I have been very much interested in the emphasis which has been laid on pain in this disease, and its constancy. While there are a few cases in which there is very little or no pain, it is surprising in the very acute and fulminating cases, and especially those of gangrenous type, how soon the pain subsides. This is only evidence that gangrenous appendices very often give little peritoneal irritability, and just in proportion as they give little peritoneal irritability, we have less vomiting, less rigidity, and less general symptoms.

The subject of appendicitis in young women is more interesting than any other stage of life, inasmuch as these cases we just talked of are particularly apropos. One point the doctor did not bring out, which I presume he considers in his general practice, and that is the early and frequent use of the blood count. It is in the younger class of patients that it is particularly important, in that we should take a blood count at the beginning to see whether the patient has a marked leukocytosis, and also whether or not it is increasing and determine, at the same time, whether she is at the period of menstruation, or whether or not she has just taken a full meal, and so on. Only frequent examinations will determine that.

Dr. Lott (closing the discussion).—I wish to thank the members very much for their discussion. The Jackson membrane was not present.

In reply to Dr. Carstens' question the patients were not cured. I did not use the stem pessary. I never have used it, and really I would be afraid to use a stem pessary. One of these patients has since married and is now four months pregnant. The cecum was low, and the suggestion of Dr. Noble of the possibility of a faulty ileocecal valve is an excellent one and quite tenable.

I did not make a blood count. In fact, I expected simply congestion. I did not expect either gangrene or pus. The rigidity of the right side was not marked, but it was present. Neither of these appendices had the hard feel which would suggest fibroids, and short of microscopical examination I could not answer that question positively.

A REVIEW OF THE PLASTIC METHOD OF CLOSING VENTRAL HERNIÆ.[1]

BY
LOUIS F. SMEAD, M. D.,
Toledo, Ohio.

The perfection of methods of operation adequate to meet any and every kind of ventral hernia is of recent date. Bull(15) and Coley no longer ago than 1896 wrote as follows: "The operation (for ventral hernia) appears to have a trifling mortality, but the permanency of the cure is still open to doubt."

Without expressing too great confidence in the present generation of surgeons, we may say that the ultimate results in all except the very largest ventral hernias are very satisfactory.

Much of the early work for the cure of ventral hernia was done upon those occurring in the midline. The congenital hernias of the abdominal wall, other than inguinal, were found most frequently in the linea alba at the navel or above or below it. Moreover, the mass of early abdominal sections were for gynecological conditions and midline incisions were used. It is, therefore, a fact that the development of the operation for ventral hernia can best be studied in the literature of midline hernia, and especially in that of the umbilical variety. Furthermore, the principles of operation evolved for hernia in this position can easily be adapted to any other form of ventral hernia.

Spontaneous cure of small umbilical hernias is the rule in children, but rare in adults. Nature always tends to close any circular opening in the body unless prevented by some secretion, the ingrowth of mucous membrane or the presence of a foreign body. Under certain conditions, therefore, we might expect small circular openings to close, but the large, and especially the elongated ones, nature cannot obliterate.

In 1836 Gerdy(27) reported the first operative cures in non-strangulated ventral hernias. He inverted the rupture, skin and all, through the ring into the abdomen and, without a skin incision, sewed the edges of the ring together, passing his sutures through the skin. His final step was to inject ammonia into the sac and gradually cause its obliteration.

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

In 1882, Bigelow(8), of Boston, used the same method except that after inverting the entire hernia into the abdomen he held the edges together with adhesive plaster while sloughing out the skin sac.

The next step was taken by Simon(57) as reported by Hadlich. After inverting the hernia, skin and all, into the abdomen he removed a strip of skin 2 cm. wide around the edge of the rupture and sewed in three layers, the first suture closing the edges of the inverted skin sac, the second the whole thickness of the ring, and the third the external skin. He reported two successful cases.

Simon's operation was modified by Hegar and Kallenbach(33), Jeffremovsky(36), and Hoffat(35).

The next advance in the operation for ventral hernia consisted in the removal of the skin and other tissues overlying the peritoneum. This was first done in a nonstrangulated case by Burkheardt(18) in 1883.

Simple lineal approximation of the margins of the ring did not prove satisfactory. The edges were brought together only under tension and did not unite. New hernias even developed in the transverse cuts made by stitches.

Many modifications were attempted and much discussion occurred as to the value of trimming the edges of the ring before uniting them, and as to the disposition of the sac.

To Lucas Championnière(20) belongs the credit for the next advance. Instead of simply uniting the edges of the ring, he approximated the anterior surface of the fascia about the hernial opening. This he accomplished by turning in the layer of sutures, closing the ring with one or two rows of Lembert sutures as one does in an intestinal suture

Kocher(42), Tavel(60), Eschenbach(25), and Bier(7) employed modifications of the Championnière method, closing the wound transversely or longitudinally and using various suture materials.

In 1886 Maydl(47) brought forward a principle which to-day is fundamental. He opened the anterior rectus sheath on both sides of the ring and sewed peritoneum, muscle, fascia and skin separately. This was the first of the so-called flap-splitting operations.

Balandin(3) had approached the idea when he modified Simon's crude operation by extending the incision around the ring not only through the skin but into the muscle. He, however, did not remove the skin sac, and he closed with through-and-through sutures and not in layers.

Tait(59) modified the Maydl operation by employing a principle he had used in vesico-vaginal fistula. He made an incision through the anterior rectus sheath on each side well into and splitting the muscles into anterior and posterior flaps. The posterior muscle flap he sewed with the peritoneum and fascia transversalis; the anterior flap was united with anterior rectus sheath.

Sänger(55) and Chrobak(21) were active in the early work with the flap-splitting operation.

Lexer(44) was among the first to use a tension suture in operating upon a hernia. He closed the peritoneum and, without opening the fascia, put in a wire purse-string suture about the ring. This was tightened and the edge of the ring sutured. It was then drawn together as much as possible and the folds made by the drawing of the circular wire suture were sewed together.

Kausch(38) used an ordinary through-and-through tension suture taking in muscle and fascia. He buried the tension suture by drawing the fascia together over them.

Hammesfahr(32), in 1895, used deeper tension sutures, passing them entirely around the recti muscles. Without opening the rectus sheath, he passed sutures through the rupture ring and under the recti on each side to the outer edges of the muscles. The sutures then passed through the fascia and over the muscles to be united in the midline. He then sewed the ring and tightened the tension sutures, burying them under the skin.

In 1897 Goldspohn(1) employed a removable tension suture. He passed doubled wires 6 cm. apart between the recti muscles and their posterior sheaths, bringing them through the skin at the linea semilunaris where the doubled sutures were tightened over gauze pads sufficiently to allow the peritoneum, muscles and fascia to be sewed together. The tension sutures were then drawn up enough to remove the strain from the approximating stitches.

The idea of doing an omphalectomy, when operating for umbilical hernia, was first suggested by Storer(58) in 1866, but was employed independently by W. W. Keen (39) in 1888.

The so-called Condamin(22) operation consisted in making a half-moon incision down to the fascia at the periphery of the hernial sac, dissecting to the edge of the ring, opening the abdomen, freeing the sac of its contents and removing sac, skin, umbilicus and all without the extensive dissection required in attempts to free the whole rupture sac. The maneuver is a valuable one and was first reported by John D. Maury(46) in 1891 and by Condamin(22) in 1892.

Numerous and ingenious muscle-plastic operations were brought out in the development of the operations for umbilical and ventral hernias but they were, for the most part, soon discarded.

In 1893 Gersung(28) was the first to advocate the use of the recti muscles as the chief tissue in closing a hernial opening. After uniting the peritoneum and the edges of the ring, if possible, he opened the anterior sheath of each rectus along the inner margin and freed the muscles thoroughly from their sheaths and from the lineæ transversæ. The mobilized muscles were then united in the midline; the outer edges of the anterior rectus sheath were drawn together, if possible.

Dauriac(23) in 1894 and Bacon(2) in 1895 made two vertical muscle bands by splitting the recti longitudinally at each side of the hernial opening. These they cut squarely off at their lower ends and crossing them, sutured the end of each into the bed from which the other had just been removed. They thus had two muscle bands crossing at the center of the rupture opening and uniting the two recti.

Wolkovicz(64) made similar longitudinal muscle bands on each side of the opening, but he cut them through their middle, opposite the center of the hernial opening. He then crossed the bands and sewed the ends together. The result was the same as in the operation just described except that the suture of the muscle bands was over the middle of the ring.

Scatolari (56) cut a muscle band from one rectus muscle and drawing it across the middle of the rupture ring he fixed it in the other rectus muscle by drawing it through the pierced muscle belly.

Salistscheff (54) made two pedunculated muscle flaps, one above and one below the hernial opening, and united them to cover the rupture.

Diaknow(24) and Starkow made one muscle flap below and turned it upward over the hernial opening.

The principle of sewing the different layers of the abdominal wall at right angles was instituted by Biondi(9). He sewed the peritoneum transversely, the muscle vertically, the fascia transversely, and the skin vertically.

During the next period in the development of this operation, fascia-plastic and muscle-plastic operations were combined in varying degrees.

In 1890 Sänger,(55) at Tait's suggestion, made the first attempt at a purely fascia-plastic operation for ventral hernia. He opened the rectus sheath on each side along the edge of the ring and freed both the anterior and posterior layers of the sheath from the muscle for some distance. He then, without sewing the muscles, made a broad approximation of the inner or muscle surfaces of both the anterior and posterior layers of the sheath by inverting the posterior layer and everting the anterior layer.

Gottschalk(30) in 1900 combined the Gersung method with a modification of the Sänger operation. After incising the posterior rectus sheath, he exposed the muscles, mobilized them freely and sewed them together in the midline. He then approximated widely the inner surfaces of the anterior rectus sheaths as one does in closing the peritoneum by the method of eversion.

Nable(49) devised still another fascia-plastic operation. He closed the peritoneum and then made an incision on each side through the anterior rectus sheath, 1 or 2 cm., lateral, to the edge of the ring. The median part of the anterior rectus sheath thus left attached to the edge of the ring and therefore continuous with the posterior rectus sheath, he inverted over the peritoneum and sutured in the midline. He next mobilized both recti muscles after the method of Gersung and sewed them together. The outer edges of the anterior rectus sheath of the two sides were not united.

Poly(53) used the same operation, but sewed the fascia flaps with the peritoneum instead of separately. He also used tension sutures.

Brenner(13) devised a fascia-plastic operation in which he made two flaps from the anterior rectus sheath like trap-doors, hinging them on the median edges of the hernial ring. These flaps he applied the one over the other, covering the rupture opening with a double layer. No attempt was made to unite the recti muscles.

Bessel-Hagen(6) modified the same operation by turning up a considerable amount of the rectus muscle with each trapdoor flap.

Heinrich(34) made a trap-door flap from the anterior rectus sheath of the right side only and, hinging it at the margin of the ring, he inverted it over the rupture opening and sewed it to the edge of a vertical incision in the left anterior rectus sheath. This latter suture line was reinforced by a second layer of sutures.

Cahen(19) devised an ingenious operation for ventral hernia like Digot's well-known operation for webbed finger, only of course reversed. On the right side he made a vertical incision through the anterior rectus sheath at some distance lateral to the margin of the ring. The median part of the rectus sheath attached to the ring was turned down with the posterior rectus sheath to widen it. He next made a longitudinal incision in the posterior rectus sheath and turned some of it up to widen the flap formed by the anterior rectus sheath. He thus had two wide anterior and posterior fascia flaps to draw across the rupture opening. He united them respectively to the anterior and posterior rectus sheath of each side. This operation, of course, could not be used below the semilunar fold of Douglas.

In January, 1899, W. J. Mayo(48) expressed the opinion that in umbilical hernia the recti were usually so far apart that it was not practical to attempt to bring them together. He therefore advised wide lateral or vertical overlapping of the fascia,—a purely fasciaplastic operation. The principle of overlapping from above downward has undoubtedly been one of the greatest advances in the development of this special field of surgery.

The same principle was worked out independently by several men and reported soon after the Mayo article appeared. Piccoli(52) made his report in August, 1899; Bonoma(12) in December, 1899; and Blake(10) in 1900.

Howard A. Kelly(40) in 1910 reported a modification of the Mayo operation consisting of wide lateral incision and freeing of the rectus fascia as far as the outer border of the muscle with very liberal overlapping of the flaps from above downward.

Still another use of the Mayo principle, which I have not found reported, was related to me by Dr. C. N. Smith, of Toledo, Ohio. In operating upon a rather difficult incisional hernia he had closed each end of the rupture but had remaining, at about the middle, a round opening like that of an umbilical hernia, which could not be closed from side to side. He met the difficulty by making lateral incisions and overlapping from above downward, after the Mayo principle.

It will be found that in suitable cases, if the rectus fascia is freed widely from the muscle and lateral incisions made as in the Mayo operation, it will be possible to close the greater part of the vertical incision and then to unite the rest by overlapping from above downward.

Another device of some value is that advocated by Bumm(16) who, after thoroughly mobilizing the anterior rectus sheath, made longitudinal incisions through it on each side to relieve tension as does Langenbeck in his operation for cleft-palate.

In 1903 Pfannenstiel(51) applied the principle so familiar to us in the Pfannenstiel incision to the cure of ventral hernia. He made a transverse incision in the rectus sheath, freed it widely, mobilized the recti muscles, united them in the midline, and closed the fascia transversely.

Judd(37) has recently published a method which is in use in Rochester. After excising the sac of a ventral hernia, the surface of the anterior rectus fascia is cleared on each side and the whole abdominal wall of one side, exclusive of the skin, is overlapped laterally upon the other. The peritoneum of one side is applied to the anterior rectus sheath of the other. The advantage of this operation is that no difficult and damaging dissection is necessary The operation was first reported by J. A. Blake(11) in 1901 with several successful cases. In some he dissected back the peritoneum and in some he did not.

In 1901 Gangitano(26) reported a principle he had used in operating upon umbilical hernias, which is similar to one reported recently by Beckman(5) for the treatment of femoral and inguinal hernias. He made a rectus incision through the abdomen and after freeing the sac of its contents from the inside, he inverted the sac into the abdomen and, without removing it, sewed through its neck, including the hernial ring in the suture.

Brun(14) reports that Nota of Turin has operated as follows on 244 children since 1890: An elastic cord 30–40 cm. long is passed around the base of the hernia with a curved needle and worked horizontally under the skin. The hernia is then reduced and held in place with the finger while the elastic cord is drawn tight and the neck of the sac obliterated. The ligature cuts through in a few days and comes away in twelve to fifteen days, and a solid cicatrix forms. He has had only one recurrence.

This method relies for its success upon the principle recently advocated that small hernias in children can be cured by simple excision of the sac.

Various foreign materials have been used to aid in the closure of ventral hernias and, in the opinion of its advocates, the wire filigree has made it possible to cure any hernia, no matter how large, if the patient's general condition will permit of the operation.

In 1890 Trendelenburg(61) transplanted bone into an inguinal hernia. Somewhat later F. König(43) used bone with periosteum successfully to close a midline hernia and also suggested the use of periosteum alone.

Recently Kirschner(41) has transplanted free fascia in closing a ventral hernia. John Stage Davis has also shown by careful experimental work that the ultimate results of fascia transplantation are good so far as the permanency of the graft is concerned.

For closing hernias, however, the fascia lata is the only satisfactory fascia and the amount of it available is limited. At present, our attitude is that we may use transplanted pieces of fascia to reinforce doubtful suture lines, but only in emergency may we depend upon it to close a hernial opening. In the future it may possibly take the place entirely of wire filigree and other foreign materials.

Perforated and gridiron plates of metal or celluloid have been used, but have been discarded for obvious reasons.

The wire filigree is deserving of considerable attention and its use has been developed by Witzel(63), Goepel (29), Bartlett(4), Willy Meyer(62), Phelps, Perry (50), McGavin(45) and others.

Witzel put in cross-wire sutures from side to side and wove them together with longitudinal wires to complete the filigree.

Goepel was the first to use the ready-made wire filigree.

Willard Bartlett(4) deserves probably more credit than any one else for the perfection of the filigree. He showed that the cross wires alone bore most of the strain and that a filigree made with one doubled vertical wire was strong enough, more pliable and less irritating to the tissues. He used 27 gauge wire and placed it between the peritoneum and muscle if possible. The filigree was overlapped for a short distance with firm tissue at the circumference and the mesh fixed in place with a few catgut stitches. Bartlett called attention to the firmness with which it was soon grasped by the ingrowing tissues.

The methods of injecting foreign substances about the rupture ring in the hope of producing a cure have been numerous, but will not be considered in this paper.

Burckhardt,(17) working with small umbilical hernias in children under twelve years, has injected paraffine directly into the inside of the sac. The paraffine is hard, with a melting-point of 54° C. and is heated to 65° C. Immediately after the injection of the paraffine, ethyl chloride is sprayed on the skin for half a minute and a flat pad firmly applied with adhesive plaster. The paraffine is supposed to form a cap inside of the abdomen, a sort of internal truss, and to produce adhesions. The hernia must be small, not over 1 cm. in diameter, if the operation is to be done at a single injection. He says that the patients complain of no pain except with the insertion of the needle.

In the treatment of ventral hernias certain general principles are important. There must be careful approximation, if not overlapping, of all fasciæ with special attention that no peritoneum, sac, fat, muscle or scar tissue prevent perfect union. The Condamin method of lateral approach to the edge of the ring has become quite generally employed.

Various means have been used to reduce excessive intra-abdominal pressure. Before operation the rupture is reduced, if possible, and the abdomen made to become accustomed to the increased pressure. Also free evacuation of the bowels and various means for the reduction of body fat are employed for weeks before operation. At the time of operation free excision of fat from the omentum and from the abdominal wall help to reduce the pressure in the abdomen. After operation the continuous flexion of the thighs and chest upon the abdomen are helpful.

It is agreed that in most cases one must depend upon fascia rather than muscle to close a ventral hernia, but that in certain cases one may employ muscle tissue alone.

The use of bandages after operation is of little value in preventing recurrence; and where a firm pad makes direct pressure over the field of operation they are harmful.

For all ordinary umbilical and ventral hernias the method of closing in layers or the Mayo overlapping operation are not only satisfactory but preferable. The method of overlapping the whole abdominal wall, exclusive of the skin, does away with much dissection and will probably gain in popularity. However, the very large ruptures, either umbilical or ventral, and especially those in the lateral abdominal wall where tissues will not stretch much, are still extremely difficult problems to meet. To successfully treat these cases the various plastic methods reviewed in this paper, especially those dealing with the fascia, are of more or less value in selected cases. Most of the muscle-plastic operations are not available because of the atrophy due to the disturbance of the circulation and nerve supply. More use can undoubtedly be made of the mobilized recti muscles than of the small flaps fashioned from them.

For the very large ruptures in which there has been much loss of tissue by sloughing, it is probable that the wire filigree is often the only possible means of closure.

The transplantation of free fascia for the cure of large ventral hernias has not as yet been thoroughly tested, but it may in time become the method of choice. At present, we can only say that it is probably a valuable means of reinforcing doubtful suture lines.

In children the very large ventral hernias are rare and their cure extremely dangerous. The smaller umbilical hernias, however, can, as a rule, be cured by simple excision of the sac with or without the closure of the ring.

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DISCUSSION.

Dr. Miles F. Porter, Fort Wayne.—There are two or three cardinal points that ought to be kept in mind in connection with the operative cure of hernia. In the first place, preceding all hernias there is a sac formed. No sac, no hernia. One of the things of first importance is to get rid of the sac, and to render that particular peritoneal surface at that point level at least; if we do not bring it together, in such a way as to form a mound, looking from the posterior aspect of the individual, so as to shunt the pressure from inside the abdomen. The next point is, that when your flaps, whatever they are made of, are coaptated, they must be coaptated without tension or you will fail in your results. In the ordinary belly, there is usually considerable room from above downward, little or no room from side to side, and on this actual fact, it seems to me, rests the Mayo and kindred operations. It is seldom we have any trouble in bringing the margins of an umbilical hernia opening together from above downward. The man who is likely to develop a hernia is the man with a pendulous abdomen. His recti muscles are longer than they need to be, but his flat muscles are shortened, therefore in the vast majority of cases approximation can be made from above downward with infinitely less tension than from side to side. One other factor, and that is, all this work must be done not only with aseptic precautions, without infection, but we must get it done with as little handling and mauling of tissues as possible because the tissue we want to leave is tissue of reduced vitality as compared with many other tissues in the body.

With these things borne in mind, personally I have never seen a case of hernia in which I felt at all the necessity for introducing any foreign body in the wound in the way of filigree or a celluloid plate. If we must have additional tissue, it seems to me that we can usually get it from the fascia lata of the thigh or from the fascia some place else, or from fascia which has been kept in cold storage.

Dr. H. W. Longyear.—This is a mechanical question entirely and we should consider it as such.

I read a paper on closing of the abdominal incision during the earlier history of this association, and I wrote and asked for the opinion of a great many eminent men in abdominal surgery at that time, asking them as to the occurrence of hernia after operation, and it was interesting to notice at that time the number of men of eminence who believed that union of muscle had anything to do with it. A great many thought that nonunion of muscular tissue was the cause of postoperative hernia. I believe we ought to forget muscle entirely in this matter. It is only the tough, nonelastic tissue, the fascia, we must depend upon. If we think of curing the hernia by uniting muscle we will fail every time. The muscle is only of use as a buttress on top of well-united fascia, and is of no other use in my experience.

Dr. Walter C. G. Kirchner, Saint Louis.—I think the paper calls attention to a very important subject, and when a hernia has been present for some time we must consider the intraabdominal pressure. For instance, I have found it advisable in those cases to put patients to rest for a certain period, after the hernia has been reduced, so that at the time of operation the tension is less. In my experience the overlapping method from above down, the so-called Mayo method, has been of great service when the hernias are small, but in the cases where the hernias were large, the results were not so good. Especially was this true in those cases in which we had much fat in the abdominal wall, and in which cases the muscle is usually attenuated. I have found that the mattress sutures used in this overlapping method from above down, would occasionally as a result of this tension cause numerous pockets to form, and instead of a large hernia we would have a number of smaller ones. So I believe in these cases, where the abdomen is very flabby and abdominal tension great, more is to be accomplished by the use of some of the other methods the doctor described, which permit an enlarging of the abdominal cavity.

Dr. J. H. Carstens, Detroit.—I want to say a word or two with reference to abdominal umbilical hernias. The distinctive feature of these umbilical hernias is obesity, and that is one reason why they will not unite very well. The first great thing is to put the patient on preliminary treatment and reduce the fat and develop the abdominal muscles and abdominal fascia by proper physical exercise, and when you do that for three months or six months and get the patient in a good physical condition, so that you can unite fascia to fascia and muscle to muscle, without uniting fat to fascia and fat to muscle, and getting it all mixed up, you will have better results than you will have by operating on every case that comes along without preparation.

Dr. Robert T. Morris, New York City.—There is one simple procedure concerning which I can give no accurate report. At various times during the past twenty years, in fleshy patients with fatty change in the abdominal wall, I have simply opened the sac, obliterated the smaller lesser sacs and have then put in a purse string suture, following it sometimes with another, I get the right degree of constriction for closing the opening, and doing nothing more excepting to brush the interior of the sac with carbolic acid—not excising it. This is done in the expectation of having hyperplastic tissue, added to the mass of constricted sac. I have asked these patients to return and have said to them, we shall probably have a return of the hernia. When the hernia returns, then we shall have gained something and you will be in a better condition for a neater operation. None of these patients have returned for operation, and my natural deduction has been they were so displeased with the result that they went to another doctor. (Laughter.) Speaking seriously, I do know that some of them remained well for years.

Dr. Thomas B. Noble, Indianapolis.—This is a matter of so much importance that I am disposed to take a little of your time to discuss it.

Dr. Porter referred to the necessity of asepsis, and Dr. Carstens has referred to the necessity for elimination of fat. Both of these points are of the greatest importance. The element of primary union depends upon the elimination of infection and careful handling of tissue. This can be avoided, not as I used to do it, by opening the sac, making my dissection from above downward and getting into the sac primarily, but simply at once amputating the sac by cutting around the hernia and holding to the sac, the sac becoming a handhold and confining my manipulation and handling of tissue very largely to this portion of skin and sac that is going to be eliminated, and by cutting around the base of the sac, then the skin is cut back carefully, and at once we will come upon the aponeurotic fascia. There being little or no fat, following the fascia down, we can peel away the fat with perfect definiteness, so that when we come to overlap the fascia below and transversely the internal oblique and peritoneum come next in place, these can be brought together, overlapping without any intervening fat substance between the two plates whatever, and with but very little handling of the tissue.

Next, a matter of importance is that the line of union shall remain fixed or splinted, if you please, as the patient moves in bed. If we can devise a way in which we can fix the surfaces and keep them perfectly at rest, we are going to do much toward insuring a prompt union of these surfaces. We have been able to accomplish this. The plates having been sutured by chromic catgut, beginning back well on the side of the abdomen, 6 or 8 inches away, we carry a heavy silver wire down through the plates we have united and out, and fasten them with gauze buttons on the abdomen to the sides. Two or three of such sutures as these will fix and immobilize these broad surfaces and the method has been of decided benefit in effecting a prompt and immediate union.

Dr. Smead (closing the discussion).—I had some hesitancy in bringing a paper of this kind before this association, but my reason for doing so was that in large ventral hernias no one method will meet all cases, and, it therefore seemed to me, if we had all of these methods well in mind, some of them might be valuable in treating individual cases.

In an enormous ventral hernia I had recently to deal with, I applied the Heinrich method of making a trap-door flap, as it seemed at the time the only thing I could do. It is a little less than a year now since I did the operation and so far it has held securely.

It was my hope that someone would take up the question of fascia transplantation. It is quite a new field, and at present we can only use it in emergency to close a hernial opening or to reinforce a doubtful suture line.

I wanted to speak a little further of the operation, for which I give Dr. Smith credit in my paper. Dr. Smith had closed each end of a ventral hernia but could not close the middle point. He had left practically an umbilical hernia. He made incisions laterally and closed the opening as if it were an umbilical hernia.

As to the suggestion made by Dr. Morris, the nearest operation I have found to the one he has mentioned is that of Lexer. He uses a circular purse string wire suture, drawing the ring together, and entirely closing it.

Dr. Noble's operation combines several principles and among them the Condamin method of approaching the ring. The tension suture which he described was originally described by Goldspohn of Chicago.

CHOLANGITIS AND PANCREATIC LYMPHANGITIS.[1]

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Any operator doing surgery of the upper abdomen is sure to encounter a considerable number of cases in which the diagnosis, based on the resemblance of symptoms and clinical signs of the text-book description of certain diseases, is proved wrong at operation.

My experience in operating for gall-bladder, stomach, duodenal and pancreatic diseases has furnished me with a long list of mistaken diagnoses. In none of these cases has the mistake been followed by such happy results as in operations undertaken for supposed carcinoma of the head of the pancreas. The symptoms and physical signs justified the diagnosis of cancer, and the enlargement of the head of the pancreas found at operation simulated such a condition. Permanent recovery following free drainage of the biliary and pancreatic systems falsified a supposedly certain diagnosis.

In my early cases I was astonished to see patients recover to whom I had given a hopeless prognosis after operations undertaken for relief of symptoms resulting from jaundice. Reference to the literature demonstrates how common was such experience before chronic pancreatitis was a definitely recognized disease.

At present we hope for the possibility of a given case not being malignant, and it is interesting to note Moynihan's reference to pancreatitis in his "Address in Surgery" at the last meeting of the British Medical Association at Brighton. He said: "Its mimicry of carcinoma may be complete."

Painlessly and progressively the patient may develop jaundice, which continues to deepen until the "black jaundice" of the older writers can be recognized. There is great loss of weight and prostration, hebetude and misery, though often the appetite is unimpaired. The liver enlarges and the gall-bladder distends to a degree which allows it to be easily seen and felt protruding below the rib margin. In accordance with the law of Courvoisier, we assume that such a dilation of the gall-bladder is due to causes other than stone. An examination of the stools might show a complete absence of bile pigment and this may seem the most conclusive evidence of carcinoma, for a chronic inflammation, however inveterate, rarely causes an absolutely impermeable block to the passage of bile.

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

Autopsy findings are, to say the least, misleading. Cases treated medically persist for such a time that the deposit of fibrous tissue becomes so marked as to make it impossible to understand how operation of any kind could cause even relief, not to mention cure, yet we know by practical experience that in the early stages of pancreatitis recovery follows operation.

As Deaver has frequently pointed out, that fibrous tissue becomes absorbed is unlikely, if not impossible. Therefore, we are driven to one of two hypotheses to explain recovery after operation in these cases; first, the process is arrested and sufficient pancreatic tissue is left to continue the normal function. This is undoubtedly true to a certain extent, but cannot explain the diminution in the size of the head of the pancreas, including with it disappearance of jaundice, which is known to occur after operation.

At autopsy on patients who die after operation, the result of postoperative and postmortem changes (which occur very rapidly in the pancreas) is such that definite conclusions of the pathology of the disease cannot be drawn. This was the case in my three deaths which occurred, one in two, two in three days respectively after operation. The most noticeable feature in these cases was the diminution in the size of the head of the pancreas, which has been markedly enlarged at the time of operation. This lessening of bulk surely could not have been due to absorption of connective tissue so soon after operation. Consequently, as an alternative, we must adopt some other hypothesis to account for this phenomenon. May we not consider that the enlargement of the head of the pancreas is due to causes other than the interstitial deposit of fibrous tissue? There is one form of inflammation which would seem to account for the fact that early cases are amenable to surgical treatment, which, however, becomes only palliative in the later stages, after deposition of fibrous tissue has occurred. This form of inflammation has been called by Deaver "Pancreatic Lymphangitis," and is probably a primary inflammation of the lymphatic vessels, which traverse the interlobular connective tissue of the pancreas.

Theoretically, the anatomy of the lymphatics and the history (early and late) of these cases seem to support this view, but from the nature of things proof is difficult and is not as yet forthcoming.

I wish to record my cases and with them my belief in the occurrence of a definite pancreatic lymphangitis, although it must be admitted at the same time that there are still missing many links to complete the chain of evidence.

The following brief description of the lymphatics of the pancreas and their relation to surrounding structures is taken directly from the various reports by Bartels in his valuable work on this subject.

The lymph vessels of the pancreas form richly interwoven networks in the interstitial connective tissue. The islands of Langerhans have no relation to the lymph-vessel system, an explanation of the absence or late appearance of glycosuria in interstitial pancreatitis of the interlobular type.

The main lymph vessels emerging from the substance of the pancreas run to one of four groups of lymph glands, named according to their position, left, superior, right and inferior.

1. The left group, known as the pancreatico-splenic, receive the vessels from the tail of the gland.

2. The superior group receive vessels from the upper part of the body and head of the pancreas and communicate with the superior gastric and hepatic lymph glands.

3. The right group, situated between the duodenum and the head of the pancreas, receive vessels from both the duodenum and the head of the pancreas, and running into this group are also larger vessels representing direct anastomoses between the duodenal and pancreatic lymph vessels. The pancreas and duodenum are thus bound together partly through direct anastomosis and partly indirectly by interlacing of branches of the larger stems.

4. The inferior group of efferent pancreatic lymph vessels run particularly to the periaortic glands, but also to a small group below the inferior border of the pancreas, and to the mesenteric and mesocolic glands as well.

All these glands receive tributaries from corresponding portions of the pancreas and some get branches from the duodenum, liver, stomach and spleen. There is a general anastomosis of vessels running from a given organ to the nearest group of glands, and in addition, around the pancreas, there is a net-like anastomosis between the pancreatic lymph vessels and those of the duodenum, portal region, mesocolon and mesentery.

The significance of the lymphatic relation of the pancreas is summed up as follows by Bartels: "The lymphatic communications demonstrated by me make possible an understanding of certain cases of pancreas disease (chronic interstitial pancreatitis) in that it comes into consideration as a port of entry for infection."

For my purpose in this paper we need only consider the lymphatic relations of the right and superior group of glands, and in these two positions we see a "port of entry" for infection from the points of greatest frequency of infection in the upper abdomen, namely, the biliary system, the stomach and the duodenum. And here, as an interesting and partly confirmatory piece of evidence, may be noted another fact emphasized by Deaver, that the head of the pancreas is the site of pathological changes and swelling, and the rest of the gland shows little or no change until the disease is well advanced, These two facts, limitation of disease to the head of the pancreas, and direct relation of the head of the pancreas to surrounding frequently infected areas, are readily understandable on the supposition that infection reaches the pancreas through the lymphatics, and would consequently be limited for a considerable time to the region supplied or drained by the lymphatic vessels communicating with the infective area. Involvement of the head of pancreas by direct extension up the duct, does not explain why the head suffers so markedly while the rest of the gland escapes involvement until late in the disease.

The postmortem findings in chronic interstitial pancreatitis are too well known to need description. The cases that come to autopsy are always those of long standing, consequently, although we should not in any way attempt to belittle the well-known work of Opie and others, the fact remains that it is at the operating-table that the pathology of the early stages of interstitial pancreatitis must be studied, and it is on the result of this study that treatment must be based.

Since Mayo Robson first caused to be generally recognized the importance of examining the head of the pancreas in every upper abdominal operation, innumerable papers have been written on the subject, but comparatively little advance has been made in our knowledge of the early changes in the interstitial type of infection. But reasoning by analogy, if free drainage cures the condition, and we know that it does, the inflammatory process has not gone on to deposition of fibrous tissue, otherwise complete subsidence of the tumor and relief of symptoms would not result; the best to be hoped for is an arrest of advancement. Therefore, it seems to me, although unfortunately I have no sections to prove it, that the inflammatory process in the early stages is represented by a lymphangitis, and certainly treatment based on this supposition gives most encouraging results.

I do not mean to assert that every case of chronic interstitial pancreatitis begins as a lymphangitis, because there are numerous well-authenticated instances of involvement through the ducts, the blood-vessels and by direct extension from neighboring organs, but my contention is that in those cases starting painlessly with jaundice, which at operation show nonmalignant enlargement of the head of the pancreas, the most likely exciting cause is lymphangitis.

The symptoms of the cases under consideration may briefly be discussed, and in the main are those usually attributed to carcinoma of the head of the pancreas.

Jaundice appearing painlessly and showing continual deepening, without any tendency to remission, is the earliest and most characteristic symptom of these cases. The cause of the jaundice may be obstruction, cholangitis, or probably both. The infection of the head of the pancreas may arise in any of the surrounding viscera, but more particularly in the duodenum or biliary system. Enlargement of the head of the pancreas in those cases in which the common duct passes through, and not behind, the head of the gland, will cause obstruction to the flow of bile, which causes jaundice or increases that already present. From this time on a vicious circle is established, the obstruction of the common duct causing jaundice and probably infection, and this in its turn continuing the infection in the pancreas by means of the lymphatics. The subjective symptoms of jaundice are constant accompaniments, and with progressive loss of weight and strength, and digestive disturbances, make up the symptomatology of these cases. Pain of an indefinite character is a fairly constant symptom, but one on which very little dependence can be placed in diagnosis.

The physical signs are usually limited to jaundice and palpable enlargement of the gall-bladder. At times, but very rarely (never in my experience) the head of the pancreas may be palpated. This is possible only in very thin patients with relaxed abdominal walls.

Even the laboratory findings are not characteristic. The changes in the feces are those due to absence of bile and pancreatic juice. This accounts for the increase in the percentage of unabsorbed fat in the feces, and also for the variation in the relation between neutral and split fats. My own experience with these laboratory findings is too limited to permit me to offer any authoritative opinion on their value.

Cammidge's reaction has always been a disappointment to me and I must number myself among those who deny any specific significance to a test devised by a man who has done a great deal of valuable work in clinical pathology.

The absence of glycosuria is another point in favor of a lymphatic infection when it would be expected that the islands of Langerhaas would escape involvement.

Diagnosis.—In spite of the statements that carcinoma of the head of the pancreas can be differentiated from other causes of obstructive jaundice by the presence or absence of stercobilin in the feces, my experience is that the cases I am discussing begin and progress clinically as cases of carcinoma and very frequently cause just as absolute obstruction of the common duct. The obstruction in early cases of cancer is not absolute. Consequently my own opinion is that the differential diagnosis is not certain until the abdomen is opened and the pancreas explored, and even then in many cases only the result of the operation (or autopsy in the event of death) can clear up the diagnosis.

Treatment.—Under these circumstances I believe I am justified in advising operation in all cases of jaundice of obscure origin. When involvement of the pancreas is found the form of operation varies to meet the condition of the organs and the views of the individual operator. The object aimed at is overcoming the infection, which will be followed by subsidence of pancreatic swelling and restoration of free outflow of bile.

To obtain these results Moynihan is a firm believer in permanent drainage of the biliary system by anastomosis of the gall-bladder to the duodenum or stomach. His results show, that in his hands, at least, this is a safe and satisfactory procedure. In my own cases I have been accustomed to draining the gall-bladder, the common duct and the retropancreatic space, through the abdominal wall.

My results, eighteen recoveries in twenty-one operations, make me hesitate to adopt the more serious procedure of gall-bladder anastomosis, although I am convinced that the latter is a most satisfactory procedure.

In operating on these cases, after determining that the cause of obstruction is in the head of the pancreas, I mobilize the duodenum to get free access to the retropancreatic space, which I drain through the abdominal wound. In this way the lymphatic connections between the duodenum and pancreas are broken up and freely drained and further infection from the duodenum is prevented.

Then I drain both the gall-bladder and common duct through the abdomen and leave the tubes in at least two weeks, whenever possible. In this way the biliary system is relieved of congestion and infection, which might reach the pancreas through its lymphatics.

I am perfectly well aware that these operative procedures are claimed to cure because they drain the bile ducts and prevent infection of the pancreatic duct by direct extension from the common duct and duodenum. This has to be considered a factor in certain cases, but in the class under discussion I have given my reasons for believing that the lymphatic system of the pancreas is the chief factor in the occurrence of the interstitial swelling.

PARK BUILDING.

DISCUSSION.

DR. HENRY S. LOTT, Winston, N. C.—During the past year I have been much impressed with the results of simple drainage of that territory in liver cases. In several cases, after a thorough exploration through an ample right rectus incision, in which I found no stones, but simply an atrophied and harmless gall-bladder, and could establish no malignancy, I have drained; sometimes through a second flank incision, closing the primary one; with a rubber tube carrying a gauze wick, well up under the liver at the junction of the cystic and common ducts, as high up as I could carry the tube, and left the tube in until nature put it out, with the result that the patients got well. I have watched them since for weeks and months and they have recovered. The jaundice all cleared up, and nausea and vomiting and inability to take food were relieved. They are now able to take food in abundance; they have gained in flesh and strength and are well.

DR. ROBERT T. MORRIS, New York City.—This is an important paper. We are apt to mistake this condition for carcinoma. The day after Dr. Deaver presented a paper on this subject two years ago I saw my first case; that is because we find what we are looking or, and within a month I had two cases but none since. This matter of lymphangitis at the head of the pancreas is commonly mistaken for carcinoma, and the points Dr. Swope has made are extremely important. The paper should be read and reviewed when it is published in the Transactions of our association.

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ORIGINAL COMMUNICATIONS.

CESAREAN SECTION. A STUDY OF A CONSECUTIVE SERIES OF CASES.[1]

BY

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(With Three Illustrations.)

In response to a request to present another paper on Cesarean section, I desire to present herewith forty-six cases, which represent our experience with this operation during the past year, from October 13, 1912, to September 13, 1913, and also for completeness, the 147 cases presented at the last annual meeting of this Association in Toledo, making in all 193 consecutive cases of Cesarean section performed by the writer since January, 1901. Some of the results of these operations are as follows:

One hundred and seventy-four, or 90.2 per cent. of these mothers, recovered and were discharged in good condition except five cases now convalescing in the Hospital. Nineteen or 9.8 per cent. of the mothers died. In the first 100 operations, there were fifteen maternal deaths. In the succeeding ninety-three operations, there were four maternal deaths, three of these were from sepsis. Two of the patients had been long in labor under the care of midwives before admission. The other septic case was wholly under our care. The fourth death was due to eclampsia with constant coma and death in twenty-five hours. Twelve of these nineteen deaths were due to some form of sepsis and nine of them acquired their fatal infection and had been under the care of midwives and doctors prior to admission to the hospital. One of the three remaining deaths due to sepsis was in a woman who made the usual good recovery and had been up and walking about for three days. On the twelfth day postpartum, there was a discharge of pus from the vagina which proved to be swarming with colon bacilli. There was no rise of temperature or other unfavorable symptoms. The vaginal discharge ceased and on the fifteenth day of her puerperium she was discharged from the hospital in apparently good condition. Two weeks later she was readmitted suffering from an abscess in the anterior abdominal wall, midway between the umbilicus amd symphysis. This abscess was found to connect with a necrotic uterus. Hysterectomy was done and she died ten days later. The second patient of this group of three was of low-grade intelligence and not physically robust. She was so filthy in her habits that it was next to impossible to keep her fingers free from feces and lochia. She died on the fifty-fourth day postpartum, from a slowly progressing septic endometritis. The twelfth death from sepsis was in a patient wholly under our care. She had a long and exhausting dry labor which lowered her resistance. No examinations were made except with sterile gloves. Manual dilatation was done and high forceps attempted but failed and it was unquestionably proved that this was not a border-line case but one positively requiring Cesarean section because of a high promontory and contracted inlet. This operation was then done at an unfavorable time and the patient died of sepsis on the eighth day, acute dilatation of the stomach being a contributing cause. Had this Cesarean section been performed at the onset, or shortly before labor began, she would in all probability have lived.

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

Four mothers died from eclampsia. Three of these suffered from constant coma and anuria and all died within the first twenty-six hours. The fourth eclampsia patient died on the first day postpartum.

One maternal death was due to pneumonia. This patient was not quite at term, almost moribund, sitting nearly upright in bed owing to great distress in breathing, and lifting the heavy abdomen with each inspiration. She was entitled to relief, and also in the interest of the child it was decided to do an antemortem, rather than a postmortem, delivery. Without moving the patient, Cesarean section was quickly done and there was great relief and improvement for twelve hours, then a failing heart which would not respond to stimulation complicated the situation and the patient died two hours later. The child lived for five days.

One patient died from acute dilatation of the stomach thirty minutes after the completion of the operation. One from shock, atonic uterus, obstinate and slow hemorrhage, after her third Cesarean operation. She was small and frail and died under conditions which a more robust patient would have withstood.

In the above series of cases 196 infants were delivered, twins in three cases. One hundred and sixty-five or 84.1 per cent. survived and were discharged in good condition, except four who are still in the hospital thriving and awaiting discharge in a few days. Thirty-one or 16.9 per cent. of the children were stillborn or failed to live. Eleven or 35.4 per cent. of this infant mortality were stillborn, including one nonviable fetus delivered by Cesarean section from a mother suffering great distress from general anasarca, tense abdominal distention and a pelvis and abdominal viscera filled with sarcoma. A considerable percentage of the remaining infant mortality was caused by premature births due to some condition in the mother which made prompt delivery imperative, such as placenta previa with hemorrhage, eclampsia (in which case the fetus not infrequently shares the mother's intoxication), or to injuries from attempts at vaginal delivery or from the compression of long labor or tonically contracted uterus. In some instances healthy robust appearing infants at the time of delivery have died within a few days from the bacteriologically proven systemic infection which was the cause of death in the mother.

INDICATIONS WHICH CALL FOR ABDOMINAL CESAREAN SECTION.

We believe that painstaking systematic pelvimetry is all important as a guide in every case of pregnancy. It covers only a part of the question, however, and not infrequently we meet cases in whom the disproportion between the pelvis and the fetus is so evident, or cases in whom craniotomy or high forceps have occurred, resulting in stillbirth or the delivery of children who have lived but a few days, that even though the pelvic measurements conform to those which are considered normal and ample, we are justified in disregarding them and delivering the child by Cesarean section.

We find that contracted pelvis in some form has been the main indication for this operation in 81 per cent. of our cases, including generally contracted pelvis, flat, oblique, funnel shape or male type, rachitic, kyphotic, double promontory, exostosis from the symphyseal or the sacroiliac joints, or a moderately contracted pelvis which is tilted backward in such a way that the relation of its axis is changed and the horizontal plane of its symphysis is abnormally below that of the promontory.

Marked disproportion between the capacity of the pelvis and the size and moldability of the fetal head may call for Cesarean section. We must estimate, not only the size of the head (or breech) but the hardness of the cranial bones and the width of the sutures and fontanelles.

Unduly large children may be the sole indication for this operation. This holds true especially in elderly primiparæ in whom the prospect of subsequent pregnancy is remote. Two such cases are found in our list.

Accidental Hemorrhage.—We have performed Cesarean section twice with this as an indication; once in a primipara with a dead fetus at about eight months, dangerous hemorrhage and undilated cervix. The mother recovered. It was also done once in a multipara in whom we had amputated a lacerated cervix which was almost in shreds, repaired the anterior and posterior wall of the vagina, suspended the uterus and operated by the Mayo method for umbilical hernia with excellent results several months prior to the last pregnancy. She was beaten by her neighbors; had a large hemorrhage from the uterus; was bleeding moderately when admitted, but not in labor. After observation for two days, quiet in bed, active hemorrhage began, fetus alive, no dilatation, Cesarean section, premature child lived seven hours. The mother made a good recovery.

Impacted Face.—We have delivered four women by Cesarean section in whom this condition was present, with a contracted pelvis in each case. Four of the mothers and three children recovered.

After Ventral Suspension.—This has been the indication in nine of our cases. In nearly all of these this was the chief indication, coupled with long, unsuccessful labor. Contracted pelvis with a history of previous operative delivery, etc., were complications in some.

Tonic Uterine Contraction.—This has been the main indication in four cases. There was in each case, however, an actually contracted pelvis, or a disproportion between the pelvis and the child, long, dry labor, and undilated cervix. Three mothers recovered. Two children were dead before operation. The other two died in a few days after delivery.

Placenta Previa.—This was present in five cases, but was the sole indication in only two. Both of these mothers and children made good recovery. Central placenta previa was unexpectedly found in a woman who was in very active premature labor when admitted and had been for many hours. Her cervix had been amputated; the internal os was not dilated; there was no hemorrhage. The interposition operation had been performed on her uterus and the perineum had been extensively repaired. Her child lived but a few hours. The other two cases had marginal placenta previa, and moderate bleeding, and also contracted pelvis which were the main indications for Cesarean section. We are in favor of employing this operation more in certain cases of placenta previa, especially in primiparous women in whom there is active hemorrhage, an undilated cervix and a viable child.

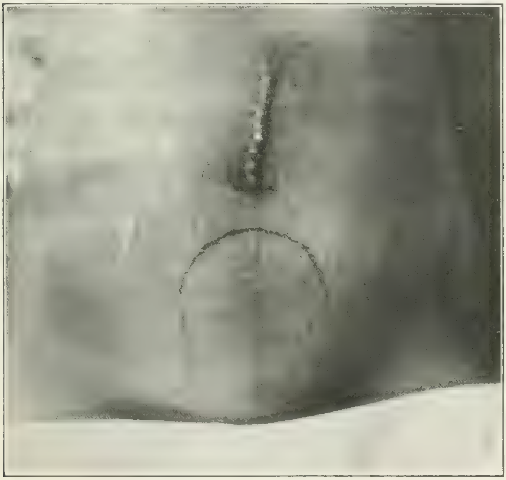

FIG. 1.—Cesarean section patient four days after operation, showing relative position of operative wound and uterine fundus.

Eclampsia.—We have delivered fifteen eclamptic women by Cesarean section. All were either having convulsions or in coma. Twelve were primiparæ. None were in labor, nearly all were not at term. Eleven, or 73.3 per cent. of the mothers recovered. Four, or 26.7 per cent. of the mothers died. Three of these had anuria, never regained consciousness and died within the first twenty-six hours after operation. The fourth died on the first day postpartum. Five children were delivered from the four mothers who died. Four of these children lived. Seventeen children were delivered from the fifteen eclamptic mothers, twins twice. Eleven or 64.7 per cent. of these seventeen children lived and were discharged in good condition. Six or 35.3 per cent. of these children were stillborn or died. Two (twins) were dead when the mother, a primipara, was admitted. The mother recovered. One was premature, seven and one-half months and a stillbirth, although the heart continued to beat for a short time after delivery. The other three children died on the twenty-third, eighth and tenth days, respectively, in the order of their birth.

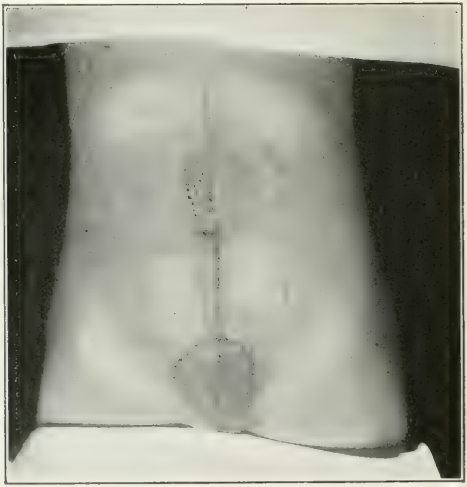

Fig. 2.—Cesarean section patient ten days after operation, showing relative position of abdominal wound and uterine fundus.

Prolapse of the Umbilical Cord.—This was the indication in two primiparæ. In each the cervix was long and less than two fingers dilated. The membranes were ruptured. The mothers and three children recovered (twins in one case). It is very doubtful if any form of vaginal delivery would have saved these children. A large percentage of Cesarean sections are performed in the interest of the child.

Neoplasms Obstructing the Birth Canal.—These have made the operation necessary in seven cases. In the cervix, preventing dilatation, two cases; sarcoma blocking the pelvis, one case; myofibroma of the uterus, two cases, and what was diagnosed as a dermoid in the culdesac, in front of the sacrum, twice in the same patient.

FIG. 3.—Mother and family, all delivered by successive Cesarean sections. Another child not shown here died at ten months of summer diarrhea. A total of six Cesarean operations on the same patient.

Atresia of the Vagina.—This was of such character that it was sufficient indication for the three Cesareans performed upon the same patient. It was coupled with a contracted pelvis which alone would have made the operations necessary.

Other Indications.—Operating, wholly in the interest of the child, upon moribund mothers, delivering antemortem rather than postmortem. Several of the eclamptics come within this class; also the case of pneumonia and a case of streptococcemia especially involving the cerebrospinal meninges. Some monsters may be delivered by Cesarean section with greater safety to the mother than in any other way.

Regarding the Sterilization of Women at the time Cesarean Section is done.—We do not advocate this except in unusual conditions.

Repeated Cesarean Section in the same Patient.—In our series, this operation has been performed thirty-one times subsequent to the first Cesarean section, twenty-one the second time, seven the third time and in one case the operation has been done six times, the last four times by the author.

Rupture of the Uterus in Labor following Cesarean Section.—This accident has befallen three of our patients. Two have already been reported. Both mothers and children recovered. In the first case the Cesarean cicatrix remained intact, the rupture taking place in the thinned lower segment. The second was only a small opening in the lower end of the site of the old wound. The third case of rupture of the uterus was fatal to mother and child. This patient was a very thin, ill-developed and much deformed kyphotic dwarf. She was delivered of her first child at term by Cesarean section on January 2, 1912. The child was weak and it died from no other apparent cause on the third day. The mother had an uneventful recovery. At the time of the operation, upon closing the uterine wound, it was found that the deformity of the spinal column had forced the uterus forward in such a way that the uterine wound instead of being wholly in the anterior wall was in the midline directly through the fundus partly in the anterior and partly in the posterior wall of the uterus. In a few months this patient again became pregnant. She presented herself every few weeks throughout pregnancy for advice and observation. Her intelligence was of low grade but an intelligent friend always came with her. Each time they were warned by us to come to the hospital shortly before term, or failing that, immediately when pains began. This advice was disregarded until labor had been in progress eleven hours and rupture had taken place. The whole length of the old uterine wound was open. The child, placenta and much blood were in the abdominal cavity and the patient was in fairly well-marked shock. Very little active hemorrhage was found. The uterine wound was closed. The patient died in twelve hours. Apparently nature resented the attempt to publish new editions or to keep this physically and mentally unfit type longer in print.

The Danger of Rupture of the Uterus in Labor Subsequent to a Cesarean Section is a Real Danger.—Careful suturing and aseptic closure of the uterine wound reduces this danger. Close observation of the patient either in a hospital or under the care of a nurse during the last week of pregnancy and Cesarean section when necessary shortly before or at the onset of labor still further reduces this danger.

The most Favorable Time in Pregnancy in which to perform Cesarean Section.—Many of these patients come in as emergency cases in labor and we are unable to choose the time for the operation.

During the past three months, we have been able to elect the time for operation in seven cases, in whom the indications for this operation were known long beforehand to be present beyond a doubt. In all of these women, except one, the duration of pregnancy could be intelligently calculated. We operated a few days before term and before the onset of labor. No attempt was made to dilate the cervix. It relaxed in each case after operation allowing ample room for drainage of lochia. We prefer this time, and, including the fifteen cases of eclampsia, who were not in labor when Cesarean section was performed, we have operated upon not less than thirty women by this method prior to the onset of labor. The mother is saved from labor pains and exhaustion; the child is not subjected to any compression.

Exception has been taken to our repeated assertion that Cesarean section is not resorted to in enough cases. The fear is constantly with us that we shall become too enthusiastic over this mode of delivery, that our judgment will be swayed and that we shall acquire the habit of employing this operation unnecessarily and that it may occur that we will merit the criticism already sometimes heard that we are working for a record. We would thus aid in bringing this truly beneficent operation into disrepute. And thus it comes about that it is our custom to weigh and consider the conditions in each individual case with all of the care and judgment which experience has given us and to decide upon that mode of delivery which will best serve the interests of a given mother and child. It is easier and safer for us to decide upon this operation than it was formerly and if we are wrong in our decision, if the operation is carefully performed under favorable conditions, no great harm has been done.

This operation has moved beyond the "last resort" idea. Its scope has been wonderfully broadened and wisely so, and yet there is too great a proportion of the medical and lay public whose conception of it and its results are those which obtained twenty or more years ago. It is to-day an infinitely simpler and safer operation than it was then. We confess to an occasional error in judgment.

What operator is there who is honest with himself and with others who is active in any field of surgery, who can prove by after-results that he has always been in the right? And yet where we have delivered one case by Cesarean section and have had cause to regret that some other method of delivery had not been employed, we have seen at least ten cases in the past year in which we are positive that the interests of mother and child would have been better served had the delivery been by early Cesarean section and we believe that the true figure should be nearer twenty. In eight months of the past year we witnessed the death of three cases of placenta previa delivered vaginally by men of ripe experience and we believe that Cesarean section would have saved each one of these patients. They were in good condition. The shock and dangerous hemorrhage came during and after delivery. That obstetrician is fortunate in his experience if he has escaped the care of a woman in labor whose tissues were whole and intact as they were created, whose unborn child was well and healthy but for some reason was out of proportion to the capacity of her pelvis, if he has not been called upon a few hours later, after some form of forcible vaginal delivery, to look upon a dead or much injured child and a mother, in many instances, lacerated and contused to a degree which is beyond our art to wholly repair. There are too many women who die or who date their change from buoyant health to an incurable invalidism from a labor similar to the one depicted, too many children dead or growing up mentally and physically deficient, not from heredity, not from faulty environment, but from injuries sustained during their birth. This is not an overdrawn or unique picture. It does not refer to experiences of the past. We witness too many such cases to-day and we are occasionally an actor in such tragedies. The contemplations of such results burn into our inner consciousness and we welcome a way of escape from them. We believe sincerely that earlier and more careful examination of each pregnant woman and a greater readiness to employ the Cesarean operation in well-selected cases offers that way in many instances and it will reduce the number of such cases materially. It is late in the day for us to look upon such results and say that we regret or to complacently say that we have done the best that we could, for too often it is not the truth. We are aware that there are communities in which complicated and difficult labors are the exception. This does not hold true of large cosmopolitan centers. There is a well-marked tendency for the difficult labors to gravitate to hospitals. To illustrate:

In six days of this present month, September 3 to 9, inclusive, in one division of the Lying-In Hospital, which represents one-half of its indoor service, there were thirty-one deliveries, as follows:

13 normal unassisted labors,
6 requiring low forceps,
2 breech deliveries,
1 twin delivery,
1 precipitate delivery in the elevator,
1 postpartum admission two hours after labor,
1 pubiotomy for contracted pelvis, long labor and outside manipulations; resulted in stillbirth from cranial hemorrhage due to forceps slipping,
1 craniotomy for contracted pelvis, in labor and under care of midwife forty-eight hours; podalic version and breech extraction to umbilicus by private physician; dead child.
1 embryotomy; child dead, shoulder impacted when admitted.
1 face L. M. A., partly dilated cervix, converted to vertex by Voorhees bag,
3 Cesarean sections for contracted pelvis, vertex incapable of being engaged. Result: three mothers and two children making good recovery; one child died shortly after delivery.

This is rather above the usual percentage of abnormalities for a given time in either service, but not markedly so. Had timely Cesarean section been employed in the case of pubiotomy and the two embryotomies, the lives of three well-developed infants would have been saved. Much more, three mothers would not have been subjected to the agonies of long labor, the dangers from sepsis and the frightful lacerations which were present in each case. Competent early examination would have revealed that this operation was plainly indicated.

Once start a series of these operations, and the history of the snowball which increases with every turn is repeated. These patients see the result of this operation and they come for subsequent delivery by this method. They know of friends who have had difficult labors, perhaps repeated stillbirths due to contracted pelvis, and they send them to be delivered by Cesarean section. Formerly it was necessary to persuade these women to allow this form of delivery even under conditions which presented no other way to secure a living child. To-day they accept our decision to deliver the child through the abdomen as readily as they do a forceps operation.

From time to time the author has been asked to attach his name to the technic of the Cesarean section which he employs. This has not been thought advisable because undoubted originators of methods of operating to which their names have been given have found that their technic is progressive and liable to change. Others describe and modify it, so that in a short time the originator is unable to recognize the first description of his technic. The writer is in no way sure that he can claim the original credit for the technic which he describes. He can say, however, that without any knowledge of its ever having been employed before, he did independently conceive this method, and was, in so far as he knew, the first to practise it in a Cesarean operation which he performed, on November 20, 1904 (C. N. 4830, Lying-In Hospital histories), although it may have been in common use by others even many years ago. He has continued to employ it to the present time, with only slight modifications, and it has proved a good method for him in over 180 Cesarean operations.

THE OPERATION.

The operation advocated is as follows:

The abdomen is opened by a median incision 8 to 10 centimeters long from above down to the umbilicus. One or two gauze pads wet in warm normal salt solution are placed in the abdomen above the fundus of the uterus to hold back omentum and intestines. Often the uterus is found twisted upon its long axis, usually toward the right side. An assistant standing beside the patient opposite the operator makes pressure with his hands outside against the side walls of the abdomen, rotating the uterus so that its anterior wall looks directly forward and so regulating his pressure that the uterus is held well up to the abdominal opening until it is emptied of its contents, child, placenta and membranes, and until several of the deep sutures are in place and tied. This, however, is in no sense a maneuver to control hemorrhage. The uterus is then carefully opened with a scalpel so as to retain the membranes intact, by an incision a little longer than the abdominal opening in the midanterior surface of the uterus from just below the fundus downward. If the placenta is found beneath this wound, a not infrequent occurrence, it should be pushed aside or torn through and with the hand in the uterus, the membranes should be separated from the uterine wall while they are yet distended. Neglect of this precaution often means that they must be removed piecemeal, sometimes with much difficulty and delay, after the child is delivered and retraction and contraction have begun, and at the time when dangerous uterine hemorrhage is most likely to occur.

The anterior thigh of the child, or the one which is most readily found, is grasped, delivered, and breech extraction is done, turning the child after delivery of the shoulders, so that it faces toward the mother's face. Then with the middle and index-fingers of the right hand astride its neck and with the same fingers of the left hand in its mouth, making traction on its lower jaw, the head is carefully delivered so that there is no sudden jolting or lacerating of the uterus in its delivery. An assistant stands ready with two long clamps in which he grasps the umbilical cord. The cord is cut between the clamps and the child is taken away to have respirations established, preferably into an adjoining room, so that the operating staff's attention may be given entirely to the mother. We now hook two fingers of the left hand into the uterus at its upper angle of the uterine wound and place and tie the upper deep suture, leaving the ends long. This is repeated at the lower angle of the wound and then with the right hand in the uterus, the placenta, menbranes and clots are removed. The first assistant now discontinues abdominal pressure and holds the uterus up to but not out of the abdominal opening by the long ends of the sutures already in place. The uterine wound is closed by two layers of sutures. The deep layer is of No. 2 chromic gut, interrupted and about 1 centimeter apart, passed through the uterine peritoneum, close to its cut edge, well out into the muscle and down to but not through the endometrium and out in reverse order on the opposite side. A double turn is taken in the first knot which will then maintain its position without the necessity of its being held by a forceps in the hands of an assistant at the risk of cutting or weakening an important suture with the forceps. The suture is drawn tight enough to bring the edges of the uterine wall into accurate apposition, yet avoiding tension which would blanch and constrict the tissues. The sutures are tied in three knots and cut short to the knot. The entrance and exit of the deep sutures are close to the cut edge of the uterine peritoneum and the short ends of these sutures render it more easy to completely bury them by the next layer which is a continuous suture of No. 1 chromic gut. Beginning at the lower angle of the uterine wound this suture is inserted and tied and the knot is covered by folding the peritoneum over it with subsequent stitches. Passing the needle well outside of the tissue included in the deep layer of sutures and parallel to the line of uterine incision, the peritoneum and some uterine muscle are caught up, alternately on one side and then the other, folding them over and completely burying the deep layer, much after the manner of the Cushing stitch in closure of intestinal wounds. This leaves no raw surface or sutures or knot ends exposed and thus reduces to a minimum the chances of subsequent adhesions of adjacent tissues to the uterine wound. The deep interrupted suture holds the two faces of the uterine wound in apposition through the whole depth of the wound. If any interrupted suture gives way its affects only the tissue held by that one suture. If a continuous suture gives way at one point, its force is weakened throughout its entire length. Every precaution should be taken to avoid adhesions and to secure strong, firm union of the uterine wound, so that the uterus may involute normally and take its position in the pelvis with its mobility unrestricted by adhesions and in the event of subsequent pregnancy the uterine scar will not rupture.

The pads are removed and the abdominal wound is closed in three layers. Dry sterile gauze pads are held in place by a snug adhesive strap across the abdominal wound which is an added support to the abdominal sutures. Elsewhere the dressings and binders are loose, so that the uterus, which is now in the lower part of the abdomen in the position occupied by a uterus after normal labor, may have free movement. The compression of the abdominal wall against the uterine wall is thus avoided and likewise the risk of adhesions between the two as was the case where the tight abdominal binder was employed. The uterus is not delivered from the abdomen at any time. The patient is placed in bed with the head of the bed elevated to favor drainage and descent of the uterus. In the uncomplicated case she suffers the pain and discomfort common to laparotomies for other causes but no more. Morphine in 1/8 grain doses is given by hypodermic injection as needed and the abdominal distention is relieved by a retained rectal tube or by a saline irrigation. Usually the mother nurses her child and at the end of forty-eight hours she is treated as a normal delivery. On the eighth day postpartum, she sits up in a chair and by the twelfth day she is ready to leave the hospital. Several of our patients have insisted upon going home on the tenth day, while others who were ready to go home on the twelfth day, for one cause or another, found it inconvenient to leave at that time, or else they lived at a distance and they were advised not to attempt to travel so soon. In the uninfected cases, the blood and liquor amnii which finds its way into the peritoneal cavity does no harm and no great effort is made to remove it.

We find the following advantages in the use of the small median incision entirely above the umbilicus: There is no danger of adhesions between the uterine and the abdominal wounds, and the uterus is therefore allowed to involute normally and take up its position in the pelvis without restricted mobility.

In the midline the abdominal wall is very thin; no important structures are divided and the tissues are quite elastic so that a small opening is all that is necessary for the delivery of the child. The small abdominal opening offers much less chance for the escape of intestine and omentum and less opportunity and necessity to handle the abdominal contents. Located above the umbilicus there is much less probability of the subsequent occurrence of hernia through the cicatrix, for it is above the most dependant part of the abdomen which is subjected to the greatest strain when the patient is in the upright position. More support is also given at this point by the recti muscles as they tend to come together toward their upper attachments.

While we have not had an opportunity to examine all of the patients upon whom we have performed this method of Cesarean section, yet there is a considerable number who return for subsequent delivery in this way, or for other causes, and thus far we have not seen a hernia in any of our patients, except in one woman in whom the entire thickness of the abdominal wound broke down, and was closed by granulation. This patient developed a hernia several months later through the site of her Cesarean wound in the abdomen.

THYROID-TISSUE TUMORS OF THE OVARY.[1]

BY
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(With Plate and Three Illustrations.)

THE occasional occurrence in ovarian neoplasms of tissue presenting both grossly and microscopically an appearance practically identical with that of the thyroid gland has been noted by numerous observers, and quite a series of such cases have been recorded in the literature. In the majority of these specimens the thyroid-like tissue formed but one constituent of a more or less complex tumor of teratomatous nature, but in a few instances good-sized ovarian growths have been encountered consisting entirely, or almost entirely, of this. These tumors present certain points of interest from the clinical as well as from the pathological standpoint; the following two cases, which have recently come under the writer's observation, seem, therefore, worthy of record, one specimen (Case II) illustrating the type of frankly teratomatous growth containing but a small area of thyroid tissue, the other (Case I) being an unusually beautiful example of the type of neoplasm made up practically entirely of such tissue.

CASE I. *History.*—Mrs. A. J., thirty-seven years, para-ii, four miscarriages, was admitted to the Hospital of the University of Pennsylvania, Aug. 20, 1912. She had never noticed anything unusual or abnormal regarding herself until ten months before admission, at which time her abdomen became slightly enlarged, and she developed a heavy feeling in this region. Both the enlargement and feeling of heaviness disappeared after a few days, the enlargement returning, however, every few weeks for a day or so at a time, but never being sufficiently marked to interfere with her routine household duties. This condition continued until three weeks before admission, at which time she was seized with very sharp pains in the lower abdomen. During this attack, which lasted only a few hours, she was forced to lie down; the next day she had a similar attack, which also passed off after a short time. She has had no pain since, but coincidently with these attacks her abdomen began to enlarge, and has been steadily increasing in size ever since. She has had no gastrointestinal nor urinary disturbances.

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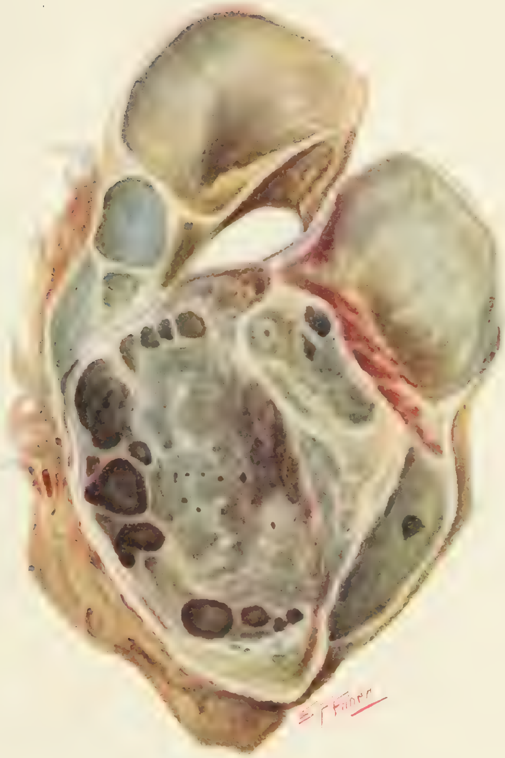
[1] Read before the Obstetrical Society of Philadelphia, Oct. 2, 1913.

PLATE I

AMERICAN JOURNAL OF OBSTETRICS
AND
DISEASES OF WOMEN AND CHILDREN
DECEMBER, 1913



OUTERBRIDGE.—Teratoma thyroidiale ovarii (sectional view). Natural size.

Operation.—Aug. 22, 1912, by Dr. A. C. Wood (to whom I am indebted for the privilege of reporting the case). Median abdominal incision; the peritoneal cavity was found to contain a large amount of ascitic fluid, which was evacuated. Tightly fitted into the pelvis there was a large cystic mass, growing from the left ovarian region. After breaking up adhesions, the cyst was removed; the other ovary was normal in appearance, and was left *in situ*. Convalescence was uneventful; eight months after the operation the patient was in good health, with no return of the ascites (report of her physician, Dr. J. S. Cobb, April 23, 1913).

Gross Description.—The specimen[1] consists of an oval mass of tissue, corresponding to the left ovary, measuring 13.5×8.5×6.5 cm. The external surface is in places smooth, white, and shining; in other areas it is much rougher, and shows numerous small, congested vessels. Beneath the surface can be seen several more or less spherical cysts, varying in size from about that of a pea up to that of a small lemon. Attached to the surface of the tumor is the Fallopian tube, measuring 6 cm. in length by 1 cm. in diameter. Throughout most of its course it is separated from the ovarian mass by a distinct mesosalpinx, but at its abdominal end the tube becomes closely attached to the tumor. It feels somewhat thickened and fibrous, but the fimbriated extremity is patulous.

On section (Plate), the two largest cysts are found to be thin-walled, and filled with clear fluid; the remainder of the specimen consists for the most part of masses of olive-brown, gelatinous material, intersected in every direction by innumerable fine, grayish, fibrous trabeculæ (not indicated in the drawing), and presenting a gross appearance strikingly similar to that of an ordinary colloid goiter. There are also a few coarser septa, and the entire mass is surrounded by a well-marked, fairly dense capsule, beneath which are several cystic cavities, varying in size up to 1.5 cm. in diameter, filled likewise with gelatinous, colloid material.

Histologic Description.—For microscopic study no attempt was made to cut the entire tumor in serial sections, as has been done in three similar cases by Walthard; this would have been a tremendous undertaking, and it was desired, moreover, to preserve the major portion as a museum specimen. A complete slice was taken through the center, however, and cut into numerous blocks, all of which were imbedded in paraffin and subjected to microscopic examination. Sections from the superficial portions all show the capsule, which varies somewhat in thickness, averaging about 2 to 3 mm.; it is composed of many parallel wavy connective-tissue bundles, and contains numerous blood-vessels, ranging in size from thin-walled, dilated capillaries to good-sized arterial and venous channels with fairly thick walls and well-developed musculature. In a few areas the arrangement of the tissue is such that it is easily recognized as ovarian stroma, though no follicles or corpora lutea are to be seen.

The underlying tissue presents in different areas somewhat varying histologic pictures. In places it is composed of numerous round or oval acini, separated by a small amount of rather cellular connective-tissue stroma, lined by a single layer of low columnar epithelium, and filled with solid masses of a homogeneous material (somewhat shrunken in places as a result of the fixing process), which is colored pinkish in hematoxylon-eosin preparations, lemon to orange-yellow in those stained with Van Gieson (Fig. 1). In portions of this homogeneous substance are seen long, narrow clear spaces, somewhat suggestive of the former presence of cholesterin crystals. The acini vary greatly in diameter, the majority being small to medium sized, others showing very marked cystic dilatation. This tissue presents an appearance so identical with that of a thyroid the seat of an ordinary colloid goiter that if two sections, one from such a thyroid, and the other from the ovarian tumor, were placed in adjacent microscopes, it would be impossible to say which was which.

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[1] Demonstrated before the Pathological Society of Phila., Nov. 7, 1912.

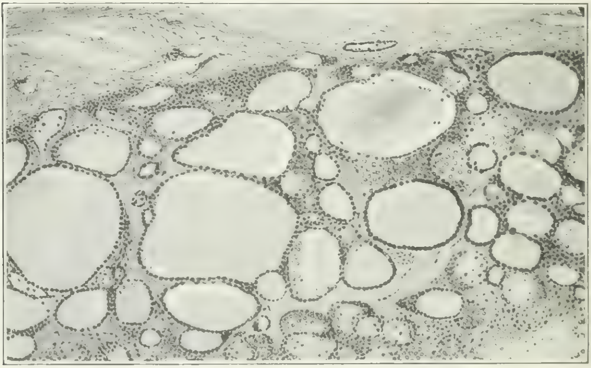

FIG. 1. ×135.

A second type of tissue, which quantitatively makes up the greater portion of the tumor, presents an appearance more suggestive of an adenoma of the thyroid. Here the acini are all small, a few are solid —reproducing the condition seen in the so-called "fetal adenoma"— but the majority have a well-marked lumen, in which there is no trace of colloid (Fig. 2). These acinar formations are imbedded in a connective-tissue stroma, whose consistency varies considerably in different areas. For the most part it is extremely loose in structure, being composed of rather fine fibrillæ, and presenting a somewhat edematous appearance; in other places it is more compact, and here and there shows a considerable amount of hyaline degeneration.

In still other areas, the entire tissue presents a looser structure,—the connective tissue is reduced to a mere delicate framework between the enormously dilated, cystic acini, which lie for the most part in immediate contact with one another. Most of them contain a small amount of colloid, this as a rule not filling the entire lumen, however, but lying as a narrow zone along one edge, or forming an irregular mass in the center (Fig. 3). It must not be supposed that these various types of tissue are sharply divided one from the other; they are found in the tumor thoroughly intermingled, together with all possible intermediate stages, but most areas show a decided preponderance of one or the other of these chief types.

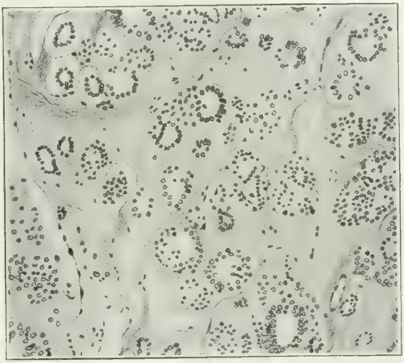

FIG. 2. ×170.

To recapitulate, then, we have a tumor, corresponding in situation to the left ovary, having a well-marked fibrous capsule, in which at places ovarian stroma can be recognized, the main body of the tumor consisting of tissue which, though differing somewhat in structure in different areas, mimics in all places the thyroid gland or its neoplasms.

CASE II.—This specimen is of somewhat less interest than the foregoing, being an example of a much commoner type of tumor—a cystic teratoma containing merely a small area of thyroid tissue—but it deserves mention in passing, if merely for comparison. The patient was fifty-two years of age, and was operated upon by Dr. H. D. Beyea at the Gynecean Hospital, Nov. 8, 1912, for the extirpation of a right ovarian cyst, the opposite adnexa being removed as well. The specimen measures in the collapsed state (ruptured during removal) 12 cm. in diameter. The greater portion is formed by one large cyst, having a wall varying from paper-thinness to about

4 mm. thick. Lying close together at one point are two smaller cysts, the size of marbles, having a yellowish external surface; on section, one of these cysts is seen to be filled with sebaceous material and a few hairs, the other is empty. Between them is a small mass, a couple of centimeters in diameter, of brownish, jelly-like material. Both tubes and the other ovary are atrophic. Microscopically, the tumor shows in places ovarian stroma, adjacent to which are several cystic cavities lined by a thin layer of stratified squamous epithelium, which shows some cornification on the surface. Adjacent to these cavities, in a region corresponding to the brownish, gelatinous material mentioned above, are a large number of smaller, follicle-like spaces lined by low, cuboidal epithelium, and in many instances filled with colloid material, the whole presenting an appearance identical with that of thyroid tissue.

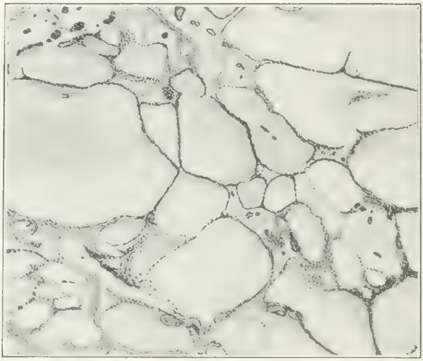

FIG. 3. ×60.

Tumors of this type are of interest chiefly from two standpoints, their etiology and their clinical significance. The first of these questions has given rise to considerable speculation and discussion, at least five or six more or less distinct sources of origin having been suggested by various authors. What is commonly considered the first of these growths to be accurately described in the literature is that reported by Gottschalk in 1889, under the diagnosis "Folliculoma malignum ovarii," his belief being that the tumor represented a malignant proliferation of Graafian follicles. A few years later, a similar specimen was studied and described by Kretschmar, who, however, interpreted it as an endothelioma, since he thought that he could demonstrate the occurrence of the primary tumor elements always within preformed lymph spaces, a proliferation of whose lining endothelium he believed to be the causative factor. Shortly after this Pick, in an extended, and at times decidedly acrimonious discussion with Gottschalk before the Berlin Medical Society, ad-advanced the theory which is now generally accepted, namely, that these thyroid-like tumors of the ovary, whether or not they contain derivatives of other embryonic tissues, are in fact *teratomata*, in which the entodermal elements of the thyroid *anlage* have undergone excessive development, with a consequent partial or complete suppression of all other tissues.

That cases such as those described by Katsurada, Pick, Anspach, Cleland, the author (Case II), and others, in which a comparatively small area of thyroid tissue forms merely one of the constituents of a frankly teratomatous growth (dermoid cyst), or even tumors consisting in main part of thyroid tissue, but containing also small areas of mesodermic or ectodermic derivatives—such as bone, cartilage, squamous epithelium, hair, teeth, etc.—are amenable to explanation by this theory is self-evident. A considerably greater degree of faith in it is demanded, however, when it comes to accepting it also for good-sized tumors composed solely of thyroid substance, or of this surrounded merely by a narrow zone of fibrous tissue containing scattered ovarian remnants, but without any suggestion of other teratomatous elements. A number of authors have refused to accept Pick's idea as applied to tumors of this character. Thus, Kretschmar, who had originally diagnosed his tumor as an endothelioma, was struck by its similarity to thyroid tissue upon reëxamining it after the appearance of Pick's paper, but was yet unable to bring himself to the atypically-developed-teratoma idea. Although giving up the endothelioma diagnosis, and admitting the identity of the tumor-tissue with that of the thyroid, he now explained the presence of this tissue in the ovarian region on the ground of a metastasis from the thyroid gland, advancing some rather unconvincing theoretical arguments in favor of the possibility of this. The chief stumbling block in the way of this interpretation was the fact that some small areas of bone were present, a circumstance which, as Kretschmar admits, strongly strengthens the teratomatous theory of origin, but he believes that they may merely represent the end-result of metaplastic changes in the connective tissue, the same thing being found in the so-called ossifying strumas of the thyroid gland itself.

Another author who is unable to accept the teratoma theory, or indeed to believe that the thyroid-like tissue occurring in ovarian tumors has anything to do with the thyroid whatever, is Bell. He describes two large, multilocular cysts, each containing a small area of tissue which he admits shows practically histologic identity with that of the thyroid; he believes, however, that this is in reality merely the result of a peculiar colloid degeneration of an ordinary cystadenoma of the ovary, the epithelial lining of the acini having been flattened out by pressure, and states that he has seen a very similar histologic picture produced in a kidney by complete obliteration of the ureter.

With these exceptions, the majority of the authors who have discussed the question have more or less completely accepted Pick's theory. In support of his contention that not only can suppression of one or two of the three embryonic layers occur during the development of a teratoma, but that *complete disappearance of all but one definite type of tissue* may take place, Pick cites the celebrated case reported by Saxer, in which a single well-formed tooth was found in an otherwise healthy ovary, an occurrence which he believes to be explainable only on the theory that a teratoma had started to develop, but that all other tissues than those of the tooth had for some reason undergone atrophy and eventual disappearance. He considers the occurrence in the testicle of tumors consisting of chorioepitheliomatous tissue to be due to a similar process.

In the effort to establish some point of identity, other than histologic similarity, between the thyroid-like tissue of ovarian tumors and that of the thyroid itself, a number of investigators have tested the ovarian-thyroid tissue for iodine, with, in a few instances, positive results. The only author to give definite quantitative figures, however, is Robert Meyer, who, although he was able to demonstrate chemically the presence of iodine, found it in such infinitesimal quantities (0.000225 gm. iodine in 16+ gm. of ash, equivalent to about 1 part of iodine in 72,000 parts of ash) that he himself admits its presence to be of comparatively little significance, notwithstanding which his findings have been quoted by several subsequent writers as proof-positive of the identity of the two tissues.

Of interest in this connection is a suggestion recently made by A. P. Jones that the presence or absence of iodine in colloid material may be demonstrated by certain microchemical reactions, particularly by the behavior of the colloid to Mallory's well-known anilin-blue orange-G connective-tissue stain.* Jones has found that the colloid substance of the thyroid gland shows under varying conditions a variable affinity for the elements of this mixture, that containing thyro-iodine staining with the anilin-blue, and that free from thyro-iodine staining with the orange-G. He has found that some thyroids, after fixation in Zenker's fluid or bichloride of mercury, and subjection to the Mallory stain, are seen to be composed almost exclusively of alveoli containing blue colloid, others almost entirely of those containing orange colloid: as a rule, however, blue and orange alveoli are found intermingled in varying proportions in the same gland, and indeed both staining reactions are often present in the colloid of the same alveolus.

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* For the sake of simplicity, Jones recommends the omission of the preliminary staining with acid-fuchsin; the writer has found, however, that it is immaterial whether this is carried out or not.

Jones explains this phenomenon on the ground that orange-G has a greater affinity for colloid than has anilin-blue, but is decolorized by any iodine present. This he has demonstrated *in vitro:* if a drop of tincture of iodine is added to a dilute solution of orange-G, the solution becomes colorless, this clearing-up being greatly accelerated by the addition of a drop of saturated bichloride solution. Further proof that blue-staining colloid indicates the presence of thyro-iodine, and orange-staining its absence, is given by a comparison of the staining reactions of thyroid with the chemical determination of their iodine content, those having the largest proportion of blue-staining alveoli showing chemically the greatest amount of iodine. Moreover, if a piece of the thyroid is excised from an animal and examined, the animal then fed potassium iodide or thyroid extract for a considerable time, and killed, sections from the thyroid removed at autopsy will show a much larger proportion of blue-staining alveoli than the piece previously excised.

It occurred to the writer that it might be of interest to subject the thyroid-like tissue of the two ovarian tumors to a similar test. Sections from both specimens were therefore stained with Mallory's mixture, and were found to give histologic pictures practically identical with those described by Jones. While the contents of the majority—probably about three-fourths—of the alveoli, especially the larger ones, take the orange stain, there are seen in both specimens a considerable number in which the colloid shows an intense blue color, exactly similar in shade to that of the surrounding connective-tissue fibers (which always take the blue stain). The two colors are totally distinct—a bright yellow-orange on the one hand, and a deep, rich blue on the other; in quite a number of instances the double reaction is found in the same alveolus, part of the contents staining orange, part blue, but here again the colors are distinct, and are sharply divided from each other. In corresponding sections stained with hematoxylin-eosin absolutely no difference can be seen between those alveoli, or parts of alveoli, which with the Mallory mixture stain blue and those which stain orange. That the blue reaction, where it occurs, is not due to any faulty action of the staining fluid is shown by the fact that in almost every instance the blue colloid is surrounded by a distinct orange zone, representing the epithelium lining the alveolus, and in no instance do epithelial cells or red blood corpuscles show any suggestion of taking the blue color. If, therefore, this reaction is of any value—and it would appear from Jones' careful experiments that it probably is—it seems highly probable that there is a distinct iodine content in the colloid of many of the acini of the ovarian tumors, a circumstance which may, perhaps, lend a certain amount of additional weight to the idea that this tissue is in fact analogous to that of the thyroid.[1]

In the writer's opinion, however, much the strongest argument in favor of the "reduced" teratoma theory is to be found in the fact that a considerable number of tumors have been reported (see table) showing various intermediate stages between the two end-types, which are so well represented by the cases described in the present paper—a large cystic teratoma with an almost insignificant area of thyroid tissue on the one hand, and a good-sized tumor consisting purely of this on the other. These types may be considered as forming the extremities of an unbroken series, throughout which the thyroid tissue shows varying degrees of development, having in a few instances completely suppressed all other elements. Of especial interest and significance in this connection are the painstaking investigations of Walthard, who undertook the extensive labor of making *complete serial sections* of three such ovarian tumors, ranging from 6 to 13 cm. in diameter. In one of these he found a mass of cartilage 10 mm. in circumference, a second, smaller one, and a little squamous epithelium; the rest was all thyroid tissue. A second specimen was composed wholly of thyroid tissue except for an area of squamous epithelium, containing sebaceous and sweat glands, which ran through only nine consecutive sections (representing therefore a thickness of probably about 1/10 mm.). Such an area as this would undoubtedly have passed unnoticed had not serial sections of the entire tumor been made. In the third specimen examined absolutely nothing was found except thyroid tissue and a little ovarian stroma in the capsule. We have in these three specimens, therefore, a beautiful example of the reduction of the mesodermic and ectodermic elements to the vanishing point; that many of the tumors—including Case I of the present report—described as consisting wholly of thyroid tissue would likewise be found to harbor microscopic foci of other tissue-types if subjected to a similarly scrutinizing examination cannot be denied, but it has been sufficiently clearly demonstrated that tumors of the ovary consisting of unmixed thyroid-like tissue can occur, and that there is no definite dividing line between these and the complex teratomata containing but small areas of this among a variety of other elements. If we admit, as seems most rational, that the thyroid substance found in these latter is of truly teratomatous origin, representing a differentiation into entodermal tissue of a portion of the original, undifferentiated *anlage* from which the complex tumor sprang, we must admit a similar origin for all growths of similar nature, no matter just what the varying degrees of relationship between thyroid and other tissue-types may be, even to complete disappearance of the latter.

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[1] The claims of certain authors, especially Neu and Wolff, that the human ovary contains normally a considerable quantity of iodine, appear to have been disproved by Zoeppritz, who in a series of carefully controlled experiments was unable to demonstrate appreciable quantities of iodine in ovaries, even when the patients from whom they were removed had been given considerable doses of iodine compounds for two days before operation.

Of greater interest to the surgeon, however, than these more or less theoretical speculations as to the histogenesis of these tumors is the question of their clinical significance. Are all or any of them malignant, and if so, to what degree? Can their probable malignancy be determined from the microscopical appearance, or can tumors which are apparently benign histologically pursue a clinically malignant course, and *vice versa?*

In analyzing the cases reported so far—almost fifty in number—we find that in many instances the descriptions are so meager and incomplete that it is practically impossible to form a definite judgment as to the true character of the tumor in question; in a number of cases, however, the malignancy of the growth appears to have been demonstrated beyond doubt. Thus, in the quite remarkable specimen reported by Katsurada, a rudimentary jaw-bone which was present, among numerous other teratomatous elements, showed extensive invasion by the thyroid tissue, the tumor thus exhibiting, as it were, a malignancy of one portion of its constituents with respect to another. It seems rational to believe that such invasive and destructive tendencies on the part of the thyroid tissue, once developed, would in all probability have extended sooner or later to surrounding structures, had not the tumor been removed. Unfortunately, no report is given as to the subsequent fate of the patient. In Kretschmar's case, although "the histologic structure was that of a pure adenoma," death occurred one year and nine months after operation, with all the appearances of a recurrence; no autopsy was performed, however. In the specimens described by Norris, Lecène (Case II), and Wood (Case III), definite histologic carcinoma was found in some portion of the tumor, but nothing is said as to the subsequent fate of the patient. In Proescher and Roddy's first case the thyroid tissue present was for the most part regular and non-malignant in type, but showed in places "labyrinthine tubal formations, lined by one or more rows of cuboidal epithelium"; in the legend accompanying a photomicrograph of such an area it is described as showing "carcinomatous degeneration of the follicles in the form of an adenocarcinoma." This patient died about two years after operation, with all the signs of a recurrence. In the same authors' third case some of the vesicles of the thyroid tissue were "outlined by a multiple layer of irregularly shaped epithelial cells, containing many atypical, hyperchromatic mitotic figures." Five months after operation the patient presented symptoms of a recurrence, and was reopened, many nodules being found in the mesentery and liver; one of these, removed from the omentum, showed the same general characteristics as the original growth. The patient died a few months later.

In Boxer's first case the histological structure is described as being "very irregular" and suggesting malignancy, a suspicion which was borne out by the clinical course. In Polano's specimen there was a distinct, active invasion of edematous, but otherwise normal, ovarian stroma by a small wedge-shaped mass of tissue, which showed in places the characteristic appearance of typical thyroid substance; in other areas, however, "the neoplastic cells appear somewhat more unripe; no longer are large colloid cysts formed, and the excessively rapid cell proliferation which is taking place indicates the malignancy of the process." The tumor, which was the size a child's fist, was accompanied by ascites, and Polano considers it certainly malignant, but gives no information as to the subsequent fate of the patient.

In all the specimens mentioned above, with the possible exception of Kretschmar's, there was fairly definite histologic indication of malignancy, and although not all of the patients have been followed up sufficiently to confirm the diagnosis clinically, there seems no good reason to doubt the evidence of the microscope in these cases. The one reported by Ulesko-Stroganowa is in a way unique, in that it is the only bilateral thyroid-tissue-tumor of the ovaries on record. She considers the growth in one ovary a metastasis from the other, and hence the original tumor malignant, although histologically no evidences of malignancy were present; the patient was well and showed no signs of recurrence nine months after operation. As Kroemer justly remarks, therefore, "this case appears more easily explicable by the assumption of a simultaneous teratoma development in both ovaries."

With the exceptions mentioned above, there appears to be no good reason for considering any of the cases of thyroid-tissue tumor of the ovary as malignant, either from a clinical or histological point of view. A few authors have suggested that all tumors consisting exclusively, or almost exclusively, of thyroid tissue should be considered at least suspicious, on the ground that the mere fact of this having in its growth so completely outstripped all other elements as to cause their practical destruction is of itself evidence of the possession of at least potential malignancy on the part of the thyroid tissue, no matter how regular and typical its histologic structure. Actual experience does not bear out this theory, however, at least in the few cases that have been followed up for a sufficiently long time to permit of definite conclusions. Thus, Gottschalk's case, although considered malignant by the author, as is evidenced by his diagnosis of "Folliculoma malignum ovarii," was alive and well four and one-half years after operation; one of Walthard's cases was followed for four years, Glockner's for three years (statement made by Kroemer), Eversmann's and Schickele's each for two years, Schipper's for one year, and the writer's for eight months after operation, with no signs of recurrence, yet in all of these practically the entire substance of the ovarian tumor was composed of thyroid tissue. Walthard's third case is especially instructive in this connection. Although serial sections showed the tumor to be composed exclusively of thyroid tissue, a subsequent autopsy upon the patient failed to reveal the slightest evidence of the ovarian growth having arisen as a metastasis from the thyroid, nor was there any sign of extension, recurrence, or other malignant characteristics. It is evident, therefore, that we cannot conclude that an ovarian tumor presenting this histologic picture is malignant *per se*, and there is still less reason to believe that the frank dermoids containing as one of their constituents a small area of thyroid tissue are in any way more malignant than they would be without this.

One or two authors have attempted to bring forward the question of ascites as an aid in the determination of malignancy, but the occurrence of this has been too irregular to permit of any value being attached to it. It is mentioned as occurring in nine of the cases collected by the writer, and as being absent in eleven; in the remaining twenty-six, no mention of it is made. It is recorded as occurring in two of the cases considered above as probably malignant (Boxer, Polano); in none of the other cases of this group was any mention of its presence or absence made, and its occurrence seven times among cases considered from other standpoints benign is of no particular moment, in view of its not infrequent presence in conjunction with various types of benign ovarian and other pelvic tumors.

A question of somewhat subordinate interest, but still deserving a word in passing, is whether or not any relationship exists between these ovarian tumors and the thyroid gland. If we cast aside the idea that the former may be the result of actual metastasis from the latter—and no single convincing argument in support of this has as yet been brought forward—the question arises, "Is the ovarian thyroid tissue to be considered in any sense a functionating structure, and if so, does its activity exert any stimulating or inhibitory influence upon the thyroid gland, or upon the general economy?" From a study of the cases so far reported, it would seem that this question must in general be answered in the negative. In five of the patients the thyroid is stated to have been the seat of a goitrous enlargement, in fifteen it appeared clinically normal, and in one instance it was found at autopsy to be distinctly atrophic; in the other cases its condition is not mentioned. The suggestion has been made by Pick that in Dingel's case the ovarian tumor may perhaps be considered as having been in a sense a substitute for the thyroid, in view of the atrophic condition of the latter found at autopsy, the only ground for this suggestion being, however, the fact that this anatomic condition was present. In only one instance, reported by Trapl, did the thyroid appear to have any functional relation to the ovarian tumor. This patient showed no swelling of the neck nor symptoms of hyperactivity of the thyroid at the time of operation; a dermoid cyst, containing a good-sized area of thyroid tissue, was removed, and a few months later she began to show a distinct enlargement of the neck, together with slight symptoms of hyperthyroidism. Trapl concludes, therefore, that in this instance the ovarian tumor may be considered as having represented to a certain degree functionating thyroid tissue, whose removal was followed by hypertrophic changes in the real thyroid. In Kretschmar's case a swelling of the neck, which was present at the time of operation, increased rapidly in size afterward, but nothing is said as to the development of hyperthyroidism, and in none of the other recorded cases, including the writer's, was there any evidence of functional disturbances in thyroid activity which could be traced to the ovarian tumor, or to its sudden removal. It seems fair to assume, therefore, that such aberrant thyroid tissue has but little or no functional significance.

A word in conclusion with regard to the nomenclature of these tumors. Various terms, some rather cumbersome, have been applied to them by different authors, *e.g.*, "Teratoma strumosum thyroidiale ovarii," "Struma thyreoidea ovarii," "Struma thyreoidea aberrata ovarii," "Struma ovarii colloides," and "Struma ovarii." The last-mentioned title appears to be the most popular; it has at least the merit of brevity, but is open to the objection that it expresses neither the genesis nor the anatomic characteristics of the tumor. The first-mentioned term, shortened to "Teratoma thyroidiale ovarii," would appear on the other hand to express in a moderately compact form the genesis, the chief anatomic characteristic, and the seat of the growth; the addition of the qualifying adjective "strumosum" seems a rather unnecessary complication. A point well taken by Dingels is that any such specific term should be limited in its application to those tumors in which the thyroid tissue forms grossly the very decidedly dominant portion, rather than applied to any and every case of dermoid cyst or solid teratoma which happens to contain a small area of this; there seems to be no good reason for singling out in these latter the thyroid portion for special emphasis, and were we to attempt to formulate a comprehensive anatomic title for such neoplasms, we should have to invent names rivalling in length and complexity those of some of the organic chemical compounds.

Conclusions.—1. In certain ovarian tumors there occur areas of tissue which cannot be distinguished histologically from that of the thyroid gland.

2. Between tumors which show a complex teratomatous structure, containing among numerous other elements a small amount of thyroid tissue, and those composed solely of this, there is no sharp dividing line.

3. All these tumors are of similar genesis; they are *teratomata*, with varying degrees of suppression of the ectodermic and mesodermic elements.

4. The large majority of these tumors are clinically benign; the few which are malignant show, in most instances, areas of unmistakable irregularity in their cellular structure, or give other histologic evidence of having assumed a destructive type of growth.

5. The thyroid tissue in the ovary is of no functional significance, at least in the vast majority of cases, and these growths give rise to

no symptoms other than those which would be produced by any type of ovarian tumor of equal size.

6. The term "Teratoma thyroidiale ovarii" is suggested as the most satisfactory designation for those tumors in which the thyroid tissue forms the dominant feature.

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TABLE OF OVARIAN TUMORS CONTAINING THYROID-LIKE TISSUE REPORTED IN THE LITERATURE.

(A few additional cases which might have been included have been omitted on account of incompleteness of reports).

Author	Year	Age	Ascites	Size of tumor	Tissue other than thyroid in ovarian tumor	Condition of thyroid gland	Remarks
Gottschalk	1899	48		Child's head.		Normal.	Well 4½ yrs. post op. Author's diag. "Folliculoma malignum."
Katsurada	1901	48		Child's fist.	Skin, hair, teeth, jaw-bone, rud. eye, respiratory epith., etc.		Thyroid tis. shows destructive growth, invading the jaw-bone.
Kretschmar	1901	48		12×8×6 cm.	Bone.	Enlarged.	Died 1½ yrs. post op. first diag. "Endothelioma," later changed to "thyroid metastasis."
Lanz	1902	54	+	Hen's egg.			Rem'd in conjunction with Talma op. for hepatic cirrhosis.
Pick	1902	33		Large fist.	Skin, oral cavity, teeth.		Also found small areas of thyroid tis. in 6 out of 21 dermoid cysts.
Anspach	1903	?		Goose egg.	Skin, hair, sebac. matter, bone.	Normal.	Small circumscribed area of thyroid tissue.
Glockner	1903	57	0	8×6×5 cm.	Cartilage, sweat gls., ovarian stroma.	Normal.	Greater part of tumor thyroid tissue.
Meyer	1903	55	+	Large fist.	Degenerated muscle, bone.		Greater part of tumor thyroid tissue. Iodine demonstrated.

TABLE OF OVARIAN TUMORS CONTAINING THYROID-LIKE TISSUE REPORTED IN THE LITERATURE.—*Continued.*

Author	Year	Age	Ascites	Size of tumor	Tissue other than thyroid in ovarian tumor	Condition of thyroid gland	Remarks
Walthard I	1903	55	0	11×7×6 cm.	Sq. epith., sebac. and sweat gls., ovarian follicles.	Enlarged.	Complete serial sects. made of all these tumors. In I the ectodermal tis. found in only 9 consecutive sects. This patient well 2 yrs. post op. Case III came to autopsy; nothing to indicate metastasis.
Walthard II	1903	33	....	6×3×2 cm.	Ovar. stroma, follicles, cartilage, mucous gls., sq. epith.	Normal.	
Walthard III	1903	?	0	13×7×6 cm.	Ovarian stroma.	Enlarged.	
Lecène I	1904	40	....	Fist.	Hair, tooth, sebac. matter, salivary gland.	....	Compar. small areas of thyroid tis. in each of these tumors. In II carcinomatous areas.
Lecène II	1904	?	....	Adult head.	Same as I.	....	
Polano	1904	56	+	Child's fist.	Edematous ovar. stroma.	Normal	Strands of tumor tissue invade surrounding ovarian stroma.
Rothe	1904	27	....	Adult head.	Skin, hair, sebac. and sweat gls., musc., cartilage, bone.	....	Well 1½ yrs. post op.
Vagedes	1904	26	0	Child's head.	Smooth muscle fibers.	....	Well 4 yrs. post op. Has since had normal pregnancy.
Bell I	1905	32	....	1/ pints.	Large multilocular cystomata with small area of thyroid tissue in each.	Enlarged.	Case I well 2 yrs. post op. Author's diag. "Colloid degen. of ord. cystadenomata."
Bell II	1905	52	....	8 pints.		Normal.	
Eversmann	1905	33	0	Child's head.	....	Normal.	Well 2 yrs. post op.

TABLE OF OVARIAN TUMORS CONTAINING THYROID-LIKE TISSUE REPORTED IN THE LITERATURE.—*Continued.*

Author	Year	Age	Ascites	Size of tumor	Tissue other than thyroik in ovarian tumor	Condition of thyroid gland	Remarks
Polosson and Violet	1905	65	....	Hen's egg.	Skin, sebac., sweat and salivary gls., cartilage.	......	Area of thyroid tis. size of a cherry.
Ulesko-Stroganowa	1905	54	+	R. 12×10×8 cm. L. Plum	Ovarian stroma in both.	Normal.	Thyroid tissue in *both* ovaries. Author considers that in left a metastasis from right.
Schipper	1907	51	+	Child's head.	......		Well 1 yr. post op.
Swanton	1907	42	....	Large cyst.	Multilocular cystoma.	Normal.	Only small area of thyroid tis.
Frank	1909	22	0	Peach.	Bone, tooth, corpus luteum.	Normal.	Well 1¼ yrs. post op.
Norris	1909	51	....	18 cm. diam.	Skin, few hairs, sebac. matter.	......	Histologic evidence of malignancy in thyroid tissue.
Wood I	1909	?	....	?	Bone, Haversian systems.	Normal.	
Wood II	1909	?	....	Small cyst.	?		
Wood III	1909	40	....	Large cyst.	Squam. epith.	......	Carcinomatous areas in thyroid tissue.
Wood IV	1909	?	....	Large cyst.	Hair, sebac. matter, bone.	......	Iodine reaction positive.
Cleland	1910	?	....	?	Dermoid constituents.	......	Only small area of thyroid tis.

TABLE OF OVARIAN TUMORS CONTAINING THOROID-LIKE TISSUE REPORTED IN THE LITERATURE.—*Continued.*

Author	Year	Age	Ascites	Size of tumor	Tissue other than thyroid in ovarian tumor	Condition of thyroid gland	Remarks
Maxwell	1910	47	....	Tangarine.	Cyst with clear fluid.	Normal.	
Poli	1910	41	0	Fetal head.	Bony particles resembling teeth, hair, sebac. matter.	Normal.	Well 2 yrs. post op.
Proescher and Roddy I	1910	36	....	25×21×18 cm.	?	....	Shows "carcinomatous degeneration of follicles." Died 2 yrs. post op., prob. recur.
Proescher and Roddy II	1910	26	....	23×16×9 cm.	Osteoid tissue, ovar. stroma.	....	Well 2 yrs. post op.
Proescher and Roddy III	1910	37	....	4×3×2 cm.	Ovar. stroma, corpora albicantia.	......	Secondary op. 5 mos. after 1st. Died in less than 1 year.
Boxer I	1911	42	+	?	....	....	Histologic structure very irregular; clinically malig.
Boxer II	1911	42	0	18 liters.	Monolocular cyst.	....	
Boxer III	1911	42	0	?	....	....	Dermoid cyst of other ovary.
Fiebach	1911	50	+	Small apple.	Ovar. stroma, corpora albicantia, follicle cyst.	....	Marked fibrosis of thyroid tis. in tumor.
Gemmel	1911	?	....	?	Ovary simulated a small fetus, with head, back, limbs, brain tissue, etc.	....	Thyroid tis. present adenomatous in type.

TABLE OF OVARIAN TUMORS CONTAINING THYROID-LIKE TISSUE REPORTED IN THE LITERATURE.—*Continued.*

Author	Year	Age	Ascites	Size of tumor	Tissue other than thyroid in ovarian tumor	Condition of thyroid gland	Remarks
Schickele	1911	29	0	5×4×5 cm.	Ovar. stroma, follicles, corpora albicantia.	Normal.	Well 2 yrs. post op.
Schauta	1911	43	+	Cocoanut.	Hair, sebac. matter.	. . . . .	Iodine reaction positive.
Dingels	1912	58	+	2 masses, ea. 5 cm. diam.	Ovarian stroma.	Atrophic.	Half of tumor thin-walled simple cyst; other half solid mass of thyroid tissue.
Trapl	1912	33	. . . .	17×11 cm.	Hair, sebac. matter, skin.	Enlarged.	Hyperthyroidism developed after removal of ovarian tumor.
Outerbridge I	1913	39	+	13×8×6 cm.	Ovarian stroma.	. . . . .	No signs of recurrence 8 months after operation.
Outerbridge II	1913	52	0	12 cm. diam.	Squam. epithelium, sebac. matter, hair.	Normal.	Small area thyroid tissue in large cystic tumor.

A CONTRIBUTION TO THE HISTOGENESIS OF SARCOMATOUS CHANGE IN UTERINE FIBROMYOMATA.[1]

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(With Six Illustrations.)

The occurrence of sarcomatous change in fibromyomata[2] was first clearly described by Virchow(1) in 1862, who pointed out the origin of these tumors from the connective tissue of the myoma. The degeneration, as he termed it, commenced in the intercellular substance, the cells increasing in number and growing larger and rounder with enlargement of their nuclei. The muscle tissue gradually disappeared as the stroma proliferated, though occasionally the muscle tissue persisted in places and even increased. Virchow also hinted at the possibility of the development of sarcoma from the myomatous portions. Since his description many authors have described tumors arising from either the interstitial tissue of a fibromyoma or from the walls of the vessels present in the growth. Ritter,(2) v. Winckel,(3) Beerman,(4) and Kahle(5) described tumors arising from the interstitial tissue. Pfannenstiel,(6) Amann, (7) and Menge(8) described the development of these tumors from the endothelium of the lymph spaces.

Hegar(9) was the first to mention the participation of the muscle cells in the development of sarcoma. Rothweiler(10) and Beisheim(11) mentioned the possibility of a metaplasia of smooth muscle cells into sarcoma, but did not describe transition stages. Gessner(12) believed that the muscle cells might be the origin of sarcoma.

Von Kahlder(13) reported a case of multiple fibroids in several of which, even though small, he found areas of true sarcoma cells well separated from the muscle bundles. He believed these groups of tumor cells to have originated from the muscle. Neither from his description nor from his drawings can one accept the case as proof of the origin of the sarcoma from the muscle cells. Williams,(14) on the other hand, reported and accurately described a case in which he could trace the transition from the muscle cells into sarcoma. He found areas of normal muscle which gradually underwent change; mitotic figures became numerous, the cells became larger and more irregular and finally, in one portion of the tumor, sarcoma tissue only was present. Pick(15) also described a similar transition and believed that in his case a further proof was added by the fact that in those places where sarcoma cells were most numerous they grouped themselves in bundles and fascicles resembling the arrangement of normal muscle tissue. Basso(16) believed that the muscle cells undergo metaplasia into sarcoma cells. He too had traced the transition from normal muscle cells and, like Pick, found that in these cases there existed a tendency for the tumor cells to arrange themselves in much the same way as normal muscle bundles. Another point that he used to support his view was the similarity in the staining properties of the normal muscle cell and the sarcoma cell, especially with the Van Gieson stain. Kynoch(17) reported a spindle-cell sarcoma originating from the muscle cells and giving rise to metastases.

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[1] From the Pathological Laboratory of the Mount Sinai Hospital. Work done under tenure of a George Blumenthal Jr. Fellowship.

[2] The terms myoma, fibromyoma and fibroids are used synonymously in this paper.

Ogorek(18) described a tumor in a woman sixty-four years old, who had noticed, for five years, a gradual increase in the size of her abdomen. Six months before operation she complained of pain, and three months later exaggeration of all symptoms and a rapid growth of the tumor. He found in the extirpated tumor two distinct areas: (1) Bands of muscle cells varying, with gradual transition, from normal to large cells with nuclei of good size, rich in chromatin. This area showed no mitoses. (2) A connective-tissue type of sarcoma cell which he took to be the primary tumor. He accounted for the progressive enlargement of the muscle cell and nucleus with their marked irregularity by some detrimental influence in their development due to the proximity of the sarcoma. He did not believe that the sarcoma could arise from the muscle.

R. Meyer(19) does not believe that sarcoma arises from ripe muscle cells, but that it is produced by unripe and undifferentiated cells, some of which give rise to sarcoma; that is, they remain unripe, and others go on to the development of normal muscle cells. Such unripe cells may thus give rise either to a pure sarcoma or myoma, or to a combination of these forms. He terms such tumors, consisting of a combination, "sarcoma myomatoides," that is, a sarcoma that has in its growth produced ripe muscle cells. The areas of apparent transition from the pure muscle cell into sarcoma he believes are due to some degenerative change, because in these sites he found hyaline and mucoid degeneration of the connective tissue. Kaufman (20) who has seen a number of cases of direct transition from ripe muscle cells, calls these tumors, as does Williams, "myoma sarcomatoides," that is, a myoma that has become sarcomatous. Kaufman considers the sarcoma to be a degenerative product not due to metaplasia. The term myosarcoma Kaufman applies to a type of tumor where there are two distinct components, a myoma and a sarcoma such as would develop when the sarcoma arises from the interstitial tissue or the endothelium of the vessels.

Ribbert(21) has made use of the expression "sarcoma in a myoma" to describe a condition in which a sarcoma occurs in a myoma, as he believes that the sarcoma arises by a progressive change in the connective tissue and not from a regressive change.

Borst(22) doubts the occurrence of sarcoma from the smooth muscle of the myoma, but believes that the tumor always has a malignant tendency and that some factor in its environment, or some nutritional disturbance causes it to become malignant both clinically and biologically.

It need not be assumed that the tumor has a malignant tendency from its inception, for trauma, environment, nutritional disturbance or diminution in local resistance may influence a normal cell to proliferate and assume a malignant type. The familiar example of trauma to normal epithelium giving rise to malignant growths is a well-known phenomenon.

That the cell changes described in areas of so-called transition are not due to degeneration, as claimed by various authors, is evidenced by the fact that these changes are of a progressive nature. We note the marked increase in size and chromatin content of the nucleus, the enlargement of the cell body and the absence of signs of nuclear destruction such as karyorrhexis or karyolysis as seen in the truly degenerate necrotic portions of the tumor. Again, the presence of mitotic figures in these areas speaks against the probability of the process being due to degeneration. Another fact against the likelihood of a degenerative change causing these conditions is that in many myomata showing hyaline, colloid and other degenerative changes, such marked variation in cell body and nucleus and the presence of mitotic figures are absent. Again, the argument has been advanced that the proximity of the sarcoma causes the degenerative process in the adjacent normal uterine muscle or in the cells of the myoma, but this condition of irregularity and variation from the normal muscle type could not be found in any of our cases where typical sarcoma was present. It would seem from the foregoing that the probability of a degenerative process as the causative factor of the variations in the type of the myoma cells is remote. The picture bears every histological evidence of being a progressive change.

In a study of 250 cases of uterine and cervical fibromyomata the writer found that twelve showed sarcomatous changes of various types. In most instances (nine cases) the myomata were multiple with a solitary focus of sarcomatous change. In but one instance were there multiple sarcomatous areas. Microscopically the sarcomata presented either pure spindle-cell type (five cases), pure round-cell (one case), or a mixture of both (six cases). The latter type contained varying numbers of giant cells. In two of our twelve cases sarcomata were found in fibromyomata, where we could trace, as had Williams, Pick and others, the progressive stages of the transition from normal muscle into sarcoma. The narrow muscle cells with their slender nuclei become larger, broader and more rounded, the nuclei also become larger, the chromatin gradually increasing in amount. In some cells the chromatin is irregularly arranged in small masses, in others it is more uniformly distributed in one large rounded or elongated mass occupying almost the entire cell. Occasional mitotic figures are seen in the transitional areas, the number of which gradually increases until in the midst of sarcoma tissue one can often find two or three figures in each field. In the transitional zones the cells keep within the bounds of the normal fascicular arrangement and direction of the muscle bundles.

The clinical and histological features of these two cases are as follows:

The first case, Mrs. A. H. (acc. No. 15230) admitted to the service of Dr. Howard Lilienthal at the Mount Sinai Hospital November 13, 1908, discharged December 3, 1908. Readmitted February 20, 1909, discharged March 16, 1909. Age forty-one years. The first menstrual period began at thirteen, regular every four weeks until recently. Periods lasted eight to nine days, profuse and painless. Married twenty years, five children. Last child three and a half years ago. Two miscarriages, the last two years ago. For the past few years has had some edema of the feet, a chronic cough, some palpitation and dyspnœa. For past few months has been menstruating every two weeks, ten to eleven days. Periods very profuse with some cramps. No loss of weight; no enlargement of the abdomen.

Physical Examination.—Signs of chronic bronchitis and nephritis. Vagina relaxed, cervix torn and hypertrophied. Uterus small, retroflexed, cavity large. A submucous tumor felt and diagnosed as fibromyoma.

November 15, curetted as palliative procedure, as patient's condition did not warrant more extensive operative measures. Nothing abnormal was found in the endometrium.

Patient returned in three months because of persistence of symptoms. Physical condition the same. February 23, 1909, vaginal panhysterectomy.

Macroscopic Examination.—The specimen consists of uterus and adnexa. The uterus is somewhat irregular and slightly enlarged, measuring. 9.5×6.5×6 cm. Surrounding the external os are numerous small cysts containing a clear gelatinous material. On opening the uterus there is seen projecting into the cavity a small rounded tumor measuring 2.5 cm. in diameter, attached by a broad base to the posterior fundal wall, and covered by intact mucosa. It is firm and elastic. Its surface is smooth and on section it is seen to be composed of many small nodules. Some of these individual nodules, especially near the periphery, have the striated appearance of fibromyomata, while those nearer the center have a smoother, white surface. Surrounding each of the small individual nodules there is a limiting capsule of striated tissue which interlaces and merges into that which envelops the entire tumor. The uterine cavity is 4.5 cm. in length; the mucosa is pale. The adnexa are normal.

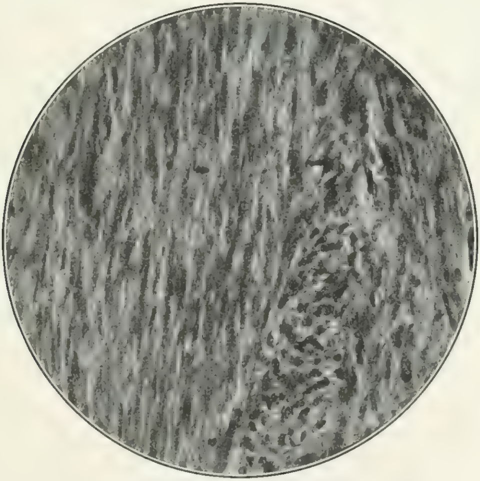

FIG. 1.—Section from the periphery of the tumor showing myomatous areas with mitosis and a few irregular nuclei. (Earliest change.) ×300.

Histological Examination.—Sections through the tumor show that the mass is composed of many smaller ones. The centers of these small tumors consist of sarcoma cells. These are large spindle cells some of which measure five to six times the size of a normal muscle cell. The nuclei of these cells also vary greatly in size, in some areas almost filling the cell, leaving but a narrow zone of pale staining protoplasm. These nuclei stain intensely and are rich in chromatin. The mass of the cells are large spindle cells with large nuclei about two or three times the size of a normal muscle cell. In these areas there are many mitotic figures. At the periphery of the smaller tumors, and also running through the centers, are streaks of muscle tissue which are undergoing a transition from the normal muscle cells to sarcoma. We find areas of normal muscle with a few irregular nuclei and an occasional mitotic figure (Fig. 1). In other areas the amount of normal muscle is less, the tumor cells in various gradations are seen, and mitotic figures become more numerous (Fig. 2). One can trace how the muscle cells elongate and broaden; the nuclei likewise become long and thick and assume bizarre forms. The chromatin becomes markedly increased and condensed, in places being granular. In some cells it is arranged in a long string-like mass and in others it is gathered into smaller and larger clumps (Fig. 3). In these transitional areas and in the sarcoma proper the cells maintain an arrangement similar to that of the normal muscle bundles. Occasional mitotic figures are seen in these transitional zones, and here also the similarity in the reaction to the Van Gieson stain between the muscle, transitional types and sarcoma cells was noted.

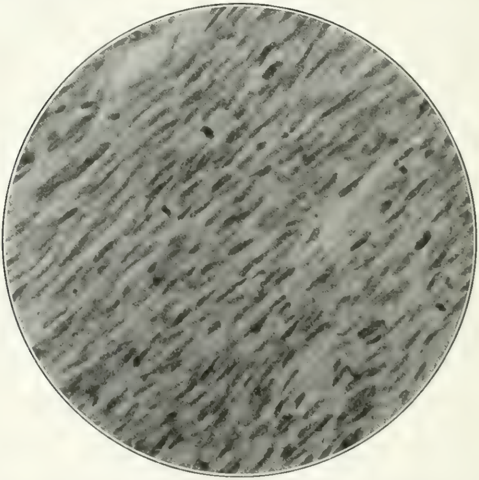

FIG. 2.—Section of tumor showing irregular cells and nuclei in normal muscle bundles; numerous mitoses. ×300

In small areas the intercellular substance takes on a diffuse pale stain resembling some type of hyaline degeneration. The tumor cells here do not vary from the form found in other portions of the growth.

Sections from the peripheral nodules show areas of transition, while those nodules nearer the center of the tumor are composed almost entirely of masses of spindle cells with many mitoses. The capsule of the tumor is composed of fibromuscular tissue, somewhat compressed, but otherwise normal in appearance. Here and there in the capsule isolated and occasional small groups of tumor cells were found.

The mucosa of the uterus was normal as were the tubes and ovaries.

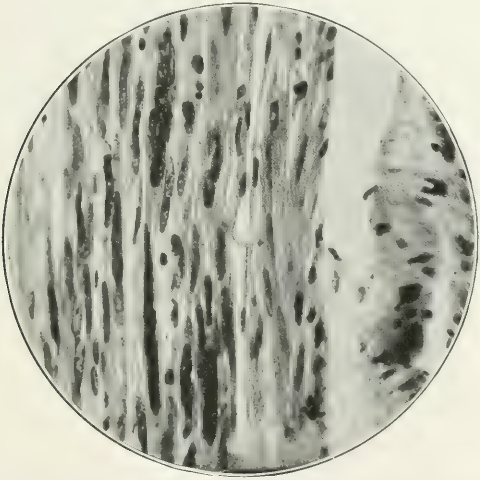

FIG. 3.—Section from central portion of the tumor illustrating irregularities in size and shape of cell body nuclei. ×300.

The second case, Mrs. B. G. (acc. No. 14161), admitted to the service of Dr. Krug at The Mount Sinai Hospital, January 12, 1912, discharged February 4, 1912. Aged forty-seven years. Previous menstrual history negative. Climacteric five months ago. Married twenty-four years. Had three children, the youngest nineteen years old. No miscarriages. The present illness dates back one week when patient had a profuse vaginal hemorrhage, since which time she has been bleeding moderately. Slight loss of weight during the past year.

Physical Examination.—Cervix is large and presents a round tumor the size of a billiard ball. Uterus enlarged and movable.

Diagnosis, cervical fibroid. Operation January 13, vaginal hysterectomy.

Macroscopical Examination.—The specimen consists of uterus and adnexa. The uterus is slightly irregular at the fundus and enlarged, measuring 12×7.5×5.5 cm. The fundus presents two small tumors 2 cm. in diameter. These are firm and elastic and on section present a striated appearance resembling fibromyomata. The uterine cavity is somewhat dilated, measuring 6 cm. The wall of the uterus is somewhat thickened, measuring 2.5 cm. Situated in the left side of the posterior lip of the cervix is a round, firm, elastic tumor measuring 5.8 cm. in diameter. It seems well encapsulated and presents the markings of a myoma. In some areas scattered irregularly through the tumor the cut surface is smooth and glistening. The cervical canal runs to the right of the tumor and is lined by intact mucosa. The mucosa of the uterine cavity is normal, as are the adnexa.

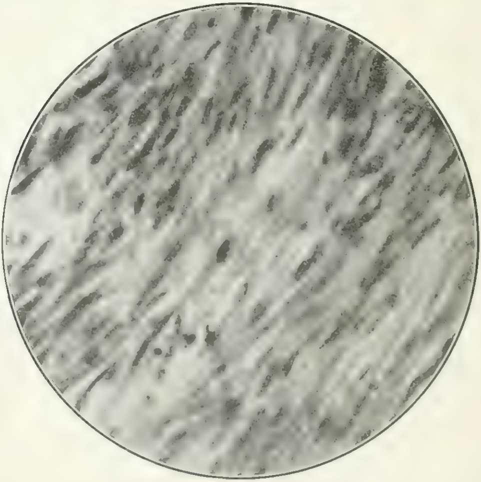

FIG. 4.—Section from portion of tumor showing normal myomatous tissue with some irregularity of the nuclei. One mitotic figure in the center. (Beginning sarcomatous change). ×300.

Histological Examination.—The main mass of the tumor is composed of spindle cells which vary in size from that of a normal muscle cell to cells four times as large. The nuclei also vary, being short and narrow with deep staining chromatin in the smaller cells, while in the larger ones they are represented by large masses and strands of darkly staining nuclear substance. Scattered in these areas are found a few multinuclear giant cells. In many places, especially near the periphery of the tumor, bands of muscle cells can be demonstrated undergoing a transition into sarcoma cells. The picture is very similar to that described in the first case. In the midst of normal myoma tissue we see an occasional mitotic figure and cells with beginning irregularity of nucleus and cell body (Fig. 4). In other areas, near the center, we find the number of irregular cells (tumor cells) increased and the mitosis more frequent (Fig. 5). The center of the tumor shows masses of sarcoma cells with mitosis and occasional giant cells (Fig. 6). We can trace the gradation from the normal myoma cell into sarcoma, observe the cells elongate, broaden and become more numerous and see the nuclei enlarge and become richer in chromatin. The nucleus assumes a more spherical form in some cells, while in others it is club-shaped, or oval, and almost fills the entire cell. Mitotic figures are seen in the transitional areas where they are fairly numerous and gradually increase in number as one approaches the areas of pure sarcoma nearer the center of the tumor. The arrangement of the cells in long strands and bundles resembling the fascicular arrangement of normal smooth muscle is maintained in the transitional and even in the sarcomatous areas to a great extent. The staining reaction of the cells in the sarcoma area, but more so in the transitional stages, is similar to that of nor-

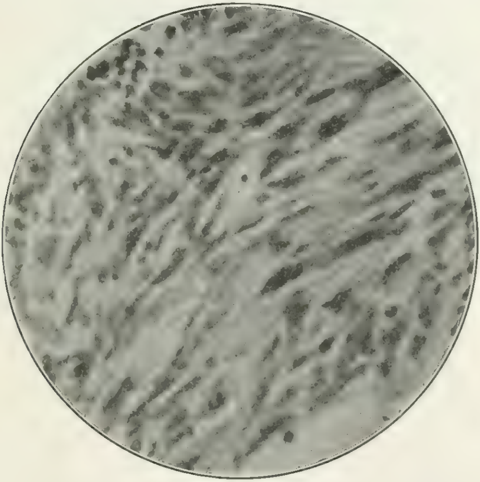

FIG. 5.—Section of tumor showing irregular cells and mitoses in normal muscle tissue. ×300.

mal smooth muscle. The entire picture is one that leaves no doubt as to the origin of the sarcoma from the myoma cells.

In some areas near the periphery, the tumor is composed of cellular myoma tissue which shows no evidence of being malignant. The capsule surrounding the tumor is composed mainly of fibrous tissue with some smooth muscle bundles. It is covered by a somewhat atrophic, but otherwise intact, cervical mucous membrane.

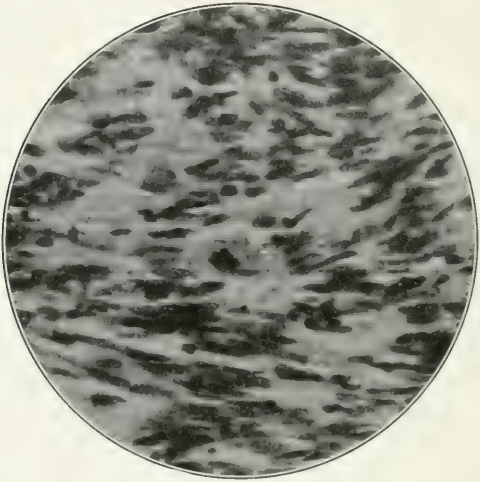

Fig. 6.—Section from the centre of the tumor showing masses of sarcoma cells. ×300.

We can, in the above cited cases, trace the transition from the myomatous tissue of the fibromyoma into sarcoma. The muscle cells are stimulated to proliferate and assume malignant tendencies. What initiated the impulse to develop cannot, of course, be determined and only leads one into the realms of speculation. From the fact that the center of the tumor shows areas of pure sarcoma, one would believe that the tumor cell in growing gave rise only to similar tumor cells and did not revert to the normal type again. At the periphery, on the other hand, one may assume that the muscle cell in proliferating gave rise either to tumor cells only, or that some of them in multiplying maintained the myomatous type at least for a few generations. The name myoma sarcomatoides is aptly applied to this type of tumor, for it represents a myoma that has become sarcomatous.

From the consideration of these two cases it would seem that there can be no doubt raised as to the origin of the sarcoma from the muscle cells of a fibromyoma. The interstitial tissue of the myoma, the adventitia and endothelium of the lymph- and blood-vessels have been recognized and accepted as sites of origin of sarcoma. To these must be added the muscle cell proper.

I wish to thank Dr. F. S. Mandlebaum, Director of the Laboratory, for his kindness in preparing the photomicrographs and for the privilege of using the material. I am also indebted to Drs. Brettauer, Krug, Lilienthal and S. M. Brickner for the clinical data of the cases studied.

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THE TREATMENT OF STERILITY BY THE DUDLEY-REYNOLDS OPERATION.

BY
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(With Eight Illustrations.)

THOMAS A. EDISON has been credited with the remark that his great forte was not in invention or conception but in developing other men's ideas. This statement applies equally well in the sphere of medicine as it does in the other walks of life. Many operations and procedures have been devised and have resulted in little use to humanity for the want of patient plodding and perseverance of the work sufficiently along the line which the operation or procedure obviously intends. In this presence it is unnecessary that I should enter into any historical survey of research which leads up to the operations we are to discuss. It is trite that there is nothing new in medicine but in the same sense this is true of all science. In the year 1666 in his orchard at Woolsthorpe, Sir Isaac Newton by the sight of an apple falling from a tree conceived the law of gravitation, that is, bodies attract one another according to certain mathematical rules. He saw that if his theory was true it would explain why the moon retained its orbit about the earth. To this end he gave his new theory to one of his students to work out. The student reported that it would not work and Newton threw his new found theory in the waste basket. About twenty years after that Newton was engaged in some chemical experiments which recalled his discarded theory of gravitation. This time he himself did the mathematical work upon it when he discovered that it worked to his entire satisfaction. To make himself doubly sure he had Halley and Wren test it. The theory worked and in 1686 the British Society accepted it as "Past Dispute," but the theory had been just as true in 1666 only the student to whom he had given it to work upon had made a simple error in addition and subtraction. So here in kindred science we have an error in procedure hold up the application of a fundamental law for a quarter of a century. The newness of anything exists not in its intrinsic originality but in its practical application to new and demonstrable results.

When Sims did the original operation of discission of the posterior wall of the cervix for the cure of dysmenorrhea and sterility he took the first step in the right direction for the cure of these two very annoying conditions. His operation was devoid of beneficial effects because a condition of erosion was produced which was as detrimental to the patient as the original condition of anteflexion. Dudley worked on Sims' original idea and went farther; he removed two V-shaped pieces from the sides of this incision in the posterior wall of the cervix, and by the application of sutures approximated raw surfaces in such a manner as to form a new os to this shortened cervical canal and placed it in a posterior position in the vagina. Likewise Skene, when he made a transverse incision in the anterior vaginal wall, approximated the surfaces of the incision longitudinally, lengthened the anterior vaginal wall, but did not straighten out the existing anteflexion. Reynolds went farther than Skene and through the same incision made by Skene separated the soft tissues from the anterior wall of the uterus in the vicinity of the flexion and thereby allowed the anteflexion to be freed and straighten out. In other words, Dudley and Reynolds have developed the original ideas of Sims and Skene, so that they are, as I hope to prove to you this evening, the Edisons of Gynecology and have made these two original operations procedures of definite merit.

I am indebted to Dr. John O. Polak for the privilege of using his records of cases operated on in his services at the Long Island College Hospital and the Jewish Hospital, Brooklyn, for the data obtained in this short paper. There have been forty-eight cases operated on since May, 1911, when Reynolds read his paper before the American Gynecological Society on "Anteflexion of the Cervix and Spasm of the Uterine Ligaments in relation to Retroversion, Dysmenorrhea and Sterility." Since receiving notice of my designation to present this subject before you I have had all of these patients written to, requesting them to present themselves for examination and up to date forty have favored us, the remaining eight have not been heard from. In most cases before the married women were subjected to the Dudley-Reynolds operation the husbands have been referred to a competent genitourinary specialist for a thorough examination and report, and in no cases have we operated where the husband was declared impotent. Neither has the operation been done on cases where there was any existing acute or chronic adnexal inflammatory trouble which was palpable. Of the forty, thirty-two are married, eight are single. In thirty-four cases dysmenorrhea has been cured; in five dysmenorrhea not relieved; in one dysmenorrhea reported as worse; or 85 per cent. of dysmenorrhea cured. In eight of the thirty-two married cases sterility has been cured. This gives a percentage of 25 per cent. cured of sterility. When Brickner presented his paper "A Review of seventy-three Cases of Dudley Operation for Dysmenorrhea and Sterility," in March, 1911, he gave the following statistics of cases which had been operated on during the preceding six years, as follows: Dysmenorrhea relieved 64.5 per cent., dysmenorrhea not relieved, 33.3 per

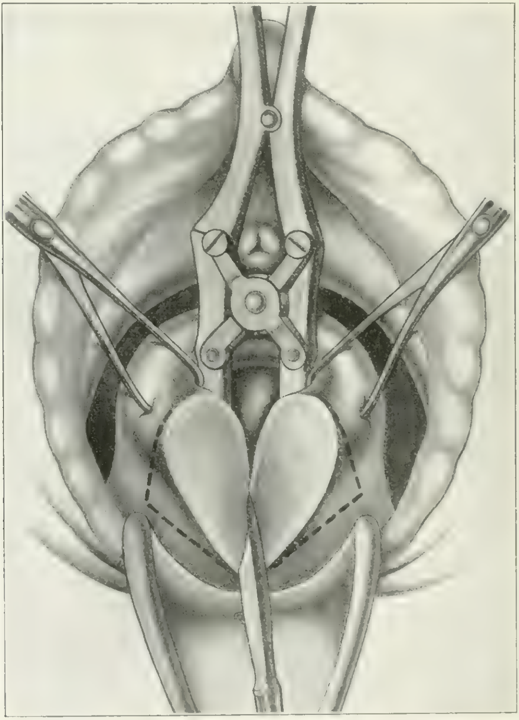
FIG. 1.

cent., dysmenorrhea worse, 2.4 per cent; sterility relieved, 27 per cent.; sterility not relieved, 73 per cent.

Inasmuch as the forty-eight cases of our series have been operated on during a period of nineteen months prior to December 3, 1912, (nine in 1911, thirty-one in 1912) we consider that out percentage of

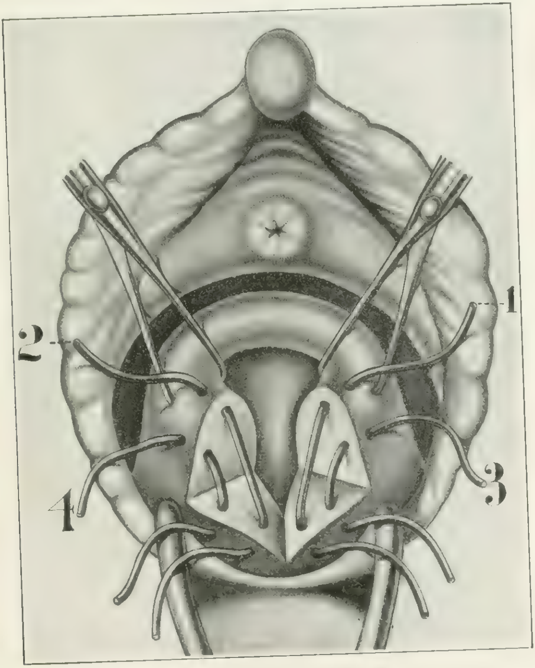

FIG. 2.

25 per cent. cures of sterility compares very favorably with Brickner's of 27 per cent.

Precision and care are of course requisites of the operating-room, but there is a technic of procedure in these operations which the operator looking for success with his patient neglects at his peril.

We have had an opportunity during the last two months of examining three patients operated on in other clinics in which a Dudley operation had been done in which the incision had entirely failed to heal, leaving large granulating surfaces. We believe it is not possible to get good results from these procedures unless each step in the operation be taken with precision and the nicest care, and therefore I venture to present the following eight illustrations.

The patient is in the dorsal position. A Sims' speculum retracting the posterior vaginal wall, the cervix is brought down by two single tooth tenaculæ, inserted one in either side of the os. The os and cervix are then iodized. The cervical canal is thoroughly dilated with the small dilator by rotary dilatation which removes the cervical mucus. We lay great emphasis upon the thoroughness of this last procedure. The uterus is then curetted and the dilator is reinserted up to the internal os, with the blades separated and the handles held anteriorly. The scalpel is then introduced between the separated blades of the dilator and an incision is made in the posterior lip of the cervix up to and including the internal os internally and externally to the uterovaginal junction—the dilator acts as an efficient guide for the incision. With the scalpel a V-shaped piece of tissue

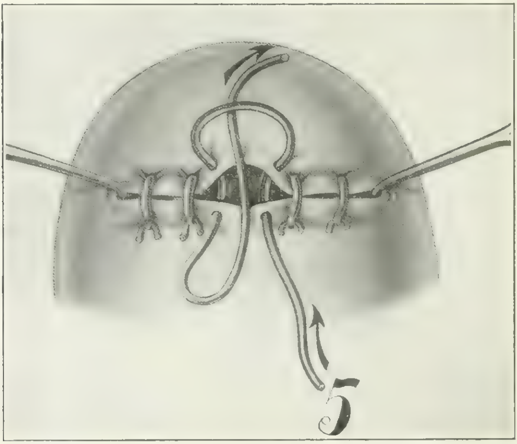

Fig. 3.

is very carefully removed from each side of this divided posterior lip of the cervix, as outlined in diagrams Nos. 1 and 2. Sutures Nos. 1 and 2 are then applied after which a Kelly hook is placed in the angle of these V-shaped incisions, lateral traction is made on them, afterward sutures Nos. 3 and 4 are applied. All four of these sutures are of No. 2 chromic gut. Suture No. 5 of fine black silk is then applied, as illustrated in diagram No. 3, and tied. It is placed for the purpose of minutely approximating the cut edges of the os and holding them in position long enough that there eventually results a normal os free from erosion. The placing of this last suture we have

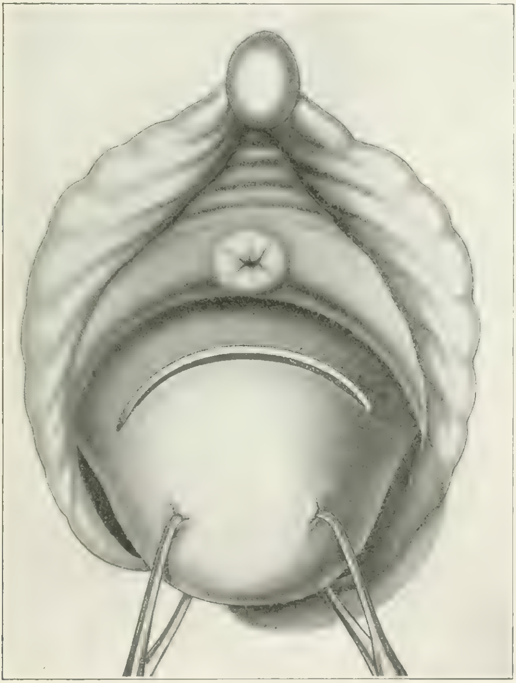

FIG. 4

come to consider of utmost importance in the performance of this operation, a detail not to be omitted. It is removed at the end of from four to six weeks. We find that a short sharp-pointed cervix needle is the most advantageous for this work. The foregoing, as illustrated by diagrams Nos. 1, 2 and 3 is the technic we pursue in the Dudley operation. The Reynolds operation is done as follows, and is illustrated in diagrams Nos. 4 and 5. Two single tooth tenaculæ are applied to the anterior lip of the cervix, the Sims' speculum is removed from the vagina, the anterior lip of the uterus

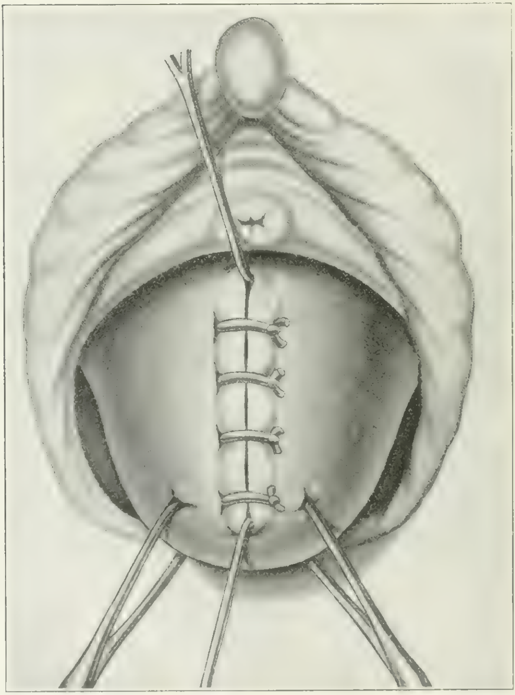

FIG. 5.

is retracted well down into view. A transverse incision is made in the anterior vaginal wall, just below the uterovesical junction, about 1 1/2 inches long, down to the uterine wall. With the finger the tissues are separated laterally by blunt dissection and the bladder pushed upward from the anterior uterine wall. It will be noticed that when this tissue is sufficiently separated the anterior uterine wall at the set of the flexion is found to be straightened out. Kelly hooks are then applied at the upper and lower medium points of this transverse incision and upper and downward traction made which transforms this transverse incision into a longitudinal one. Chromic gut sutures are then applied to this longitudinal opening in the anterior vaginal wall, but not including the uterine wall. The suturing of this transverse incision in a longitudinal direction gives a much longer anterior vaginal wall. The hooks are then removed, the cervix is carried backward and a small strip of iodoform gauze placed in the vagina, which is removed at the end of twenty-four hours. In diagram No. 6 we have tried to illustrate schematically, without exaggeration, the condition existing in these cases before operation—namely, the cervix and os in the axis of the vagina, a shortened anterior invagination and a long posterior invagination of the cervix with acute anteflexion in the anterior uterine wall. Diagram No. 7 shows a shortened posterior cervical lip, external os in the seminal pool, and a straightened uterine canal. This diagram also illustrates a condition which frequently remains after the Dudley has been performed, that is an acute flexion in the

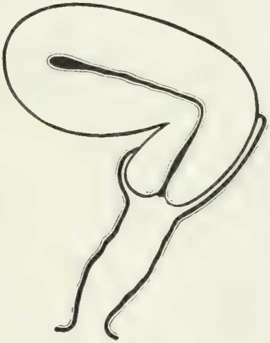

Fig. 6.

anterior uterine wall; and this condition is removed by the Reynold's operation. In diagram No. 8 we have tried to illustrate the conditions we strive to obtain in the performance of the Dudley-Reynold's operations—namely, the cervix is in its normal axis out of the axis of the vagina; a straightened uterine canal; a shortened posterior cervical lip; a longer anterior invagination; removal of the flexion of the anterior uterine wall, and placing the external os far back in the seminal pool.

Conclusions.—The Dudley operation if properly done according to the foregoing details gives the following satisfactory results: It takes the cervix out of the axis of the vagina and put it in its normal axis; it removes the external os from the anterior position in the vagina and places it well back in the seminal pool. The Reynold's operation removes the flexion of the anterior wall of the uterus and gives a longer anterior invagination with a straightened anterior uterine wall. That dysmenorrhea is cured in 85 per cent. and sterility cured in 25 per cent. of the cases in which we have done this operation. According to the idea put forward by McNaughton the possibilities of fibroid growths of the uterus are diminished because normal uterine drainage and circulation is established. The scar left in the cervix as the result of the Dudley operation dilates readily and in no instance has been the cause of dystocia. That the Dudley-Reynolds not only cures dysmenorrhea and sterility but brings a marked improvement in the general condition of the patient.

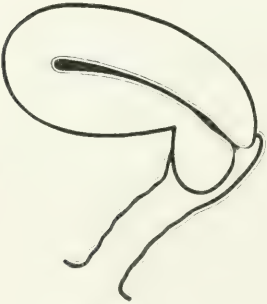

Fig. 7.

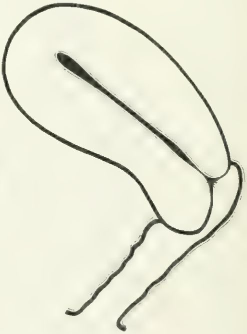

Fig. 8.

108 Lincoln Place.

NOTES ON ADVENTITIOUS TISSUES OF THE ABDOMINAL CAVITY.[1]

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(With Three Illustrations.)

About twelve years ago I began to be impressed with the significance of adhesions of insidious formation in the cephalad part of the peritoneal cavity. These were spoken of for purposes of forming a concrete mental picture as "cob-webs in the attic of the abdomen."

The first paper upon the subject was published in the *New York Medical Record* for December 26, 1903, under the title "Intestinal Fermentation as it Interests the Surgeon." The subject gradually enlarged under observation, and my points of view changed from time to time, finally including the idea that adhesions in the attic of the abdomen were of two types—one relating chiefly to connective tissues, and the other relating chiefly to endothelial tissues.

The first group included defects of embryonic character which remained as peritoneal structures when there was failure of complete normal absorption of apposed peritoneal surfaces in the fetus. Some of these structures become much enlarged under the influence of stress in cases of visceral ptosis.

The other group of adventitious tissues of the upper abdominal sort occurs as a result of toxic injury to endothelial cells. Toxins which cause this injury to endothelial cells appear to be of two sorts—the ones which make their way through walls of the bowel and bile-ducts, and toxins which are formed by bacteria (colon bacilli and anaërobes) existing in the free peritoneal cavity, under conditions which are of frequent occurrence in this era of physical decline belonging to our cultural period. Such response of cell protoplasm to toxins which do not cause actual inflammation may be allergic in character.

In the same year in which my first paper upon the subject was published Mr. W. Arbuthnot Lane published (*Lancet*, vol. i, 1903, p. 153) his paper entitled "Chronic Obstruction of the Cecum and

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

Ascending Colon," and from that time began his dissertation and evolution of ideas in connection with adventitious tissues within the abdomen, and their relation to insidious toxic influences. Apparently we began to write upon the same subject in the same year, but using different fields in the abdominal cavity for our respective observations. The matter of priority in publication is of little consequence in this instance and has no significance beyond the fact that toxic influences of similar character were recognized by two surgeons simultaneously.

Mr. Lane's ideas received general recognition first, but he tells me that as great difficulty was found in engaging the attention of the profession in his country as I had encountered here. In both countries our views met about the same sort of opposition, which is natural and desirable in a conservative profession, for purposes of correcting errors belonging to theories which may be fanciful.

So far as I know Dr. Musser of Philadelphia was my only active champion in this country from the first, in connection with the subject of adventitious tissues within the abdominal cavity and their relation to insidious toxic influences.

In 1909 Jackson came forward with his description of the membrane which carries his name.

In 1853 Virchow described adventitious tissues, or abnormal development of membranes within the peritoneal cavity, and speculated on their significance, but in his day the subject of intestinal toxemia had not been developed and the observations of Virchow were passed by without further elaboration by members of the profession.

At the present time we may perhaps condense the entire subject in the form in which it was arranged in relation to "attic adhesions."

(1) A number of embryonic remnants undergo evolutionary change and serve a mechanical purpose, under the influence of stress belonging to visceral ptoses which are characteristic of the neurasthenic condition common to this part of our cultural period. Some of the hypertrophic remnants exert malign influence.

(2) Toxins which develop in excess from bowel bacteria and which cause a lessening of efficiency of ductless glands in patients of neurasthenic habit (and in some others) injure endothelial cells of various parts of the peritoneum. The plastic exudate which follows this toxic injury results in the formation of adhesion tissue. Toxins likewise influence the connective tissues of normal peritoneal supports, resulting in a fibrinous deposit and connective-tissue hyperplasia similar to that of Dupuytren's contraction of the palmar fascia (also of toxic origin).

Toxins may or may not influence both the connective-tissue cells and the endothelial cells of embryonic-relic structures. In some cases of Jackson's membrane we find new inflammatory products at points of greatest stress; in other cases of Jackson's membrane we find no evidence of an irritative process of any sort.

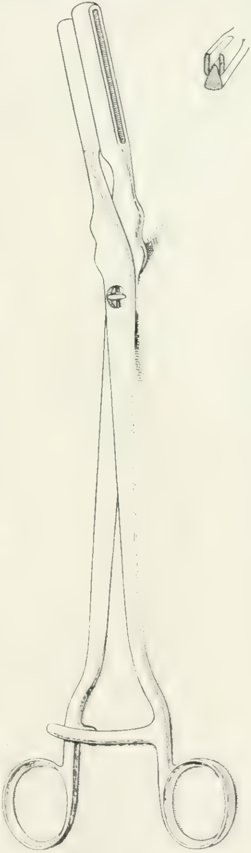

FIG. 1.—The doormaker.

The question which interests surgeons relates to work which must be done when medical treatment has failed to give relief to the patients who are suffering from the effects of adventitious abdominal tissues. This medical treatment belongs to the newer knowledge of the twentieth century, and includes a study of all those influences which are exerted upon the individual patient in such a way as to allow the development of various species of intestinal bacteria in excess. Medical treatment includes also an elaborate and thorough study of such hygienic measures as are required for maintaining the physical well-being of any given patient.

In olden times it was a rule in surgery to get the patient into good condition before doing a surgical operation, if possible. We later changed to the idea of doing a surgical operation in order to allow the patient to be put in good condition. These two positions representing extremes are to be supplanted by a mean position in relation to the surgery of adventitious peritoneal tissues.

In cases in which the patient does not progress rapidly enough toward health under medical and hygienic resources, the physician is to avail himself of the resources of the surgeon. Surgery in these cases is of temporary benefit only unless the internist keeps any given case well in hand. The methods of the internist are of temporary service only unless he asks the surgeon to relieve the patient from sources of irritation which are found to be persistent.

The earlier surgery relating to toxic processes of intestinal origin was unduly severe, and in the course of my own operative work a rather simple surgical procedure has been adopted for short-circuiting the bowel and throwing most of the colon with its toxins out of commission. Once in a while it is desirable to suspend or to remove the colon, to separate extensive Jackson's membrane, or to divide the adventitious tissue of a Lane kink, but for the most part we may accomplish all that is desired by short-circuiting the bowel by a procedure which keeps the patient in bed hardly more than ten days in the average case.

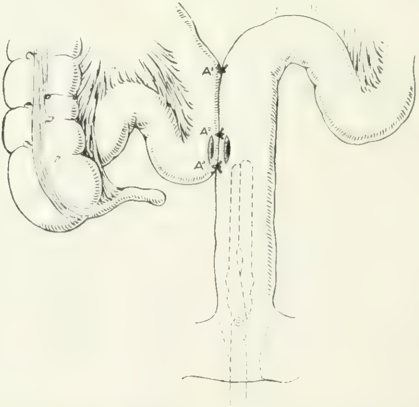

FIG. 2.—A 1, 2, 3, sutures which are introduced to prevent leakage before the wedge jaw is thrust through slits in ileum and sigmoid. Dotted lines show the doormaker ready to be opened by an assistant.

This procedure consists in making a small median abdominal incision long enough to allow us to bring up a loop of ileum and a loop of sigmoid. The parts chosen are ileum a few inches away from the cecum and sigmoid a few inches above the rectum. An instrument which is here presented and which has been named the "doormaker" is passed into the rectum, a fold of gauze having been wrapped around the handles to prevent mucous membrane of the rectum from slipping between the arms of the handles. This loose sleeve of gauze is held in place with an ordinary rubber band slipped over the depressions which are made for that purpose in the blades. The wedge-shaped blade of the doormaker is thrust through the wall of the sigmoid and through the wall of the ileum. When the jaws are snapped together the wedge-shaped jaw crowds bowel wall into the fenestrated jaw and cuts off its circulation. Before thrusting the wedge-shaped jaw through the two bowel walls, three sutures are placed as shown in Fig. 1 to prevent leakage. When the jaws of the instrument are snapped together, three corresponding sutures are introduced at the points at which they are seen to be needed.

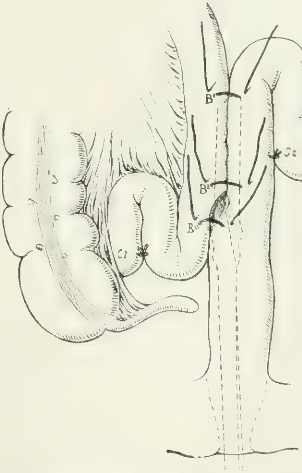

FIG. 3.—Doormaker in place and jaws closed. *B* 1, 2, 3, final row of sutures to prevent leakage, *C* 1, angulation suture for ileum; *C* 2, angulation suture for sigmoid.

The next step has for its object the shunting of ileal contents through the doorway. In order to facilitate this process the ileum is angulated and held with a single suture, as shown in Fig. 3. In order to prevent reversed peristalsis from carrying contents of the rectum back into the colon the sigmoid is angulated and maintained in this position by a single suture (shown also in Fig 3). At points of introduction of the angulation sutures the peritoneum is scarified in order to ensure local adhesions.

The abdominal wall is closed and the handles of the doormaker protruding from the rectum are supported with a strip of rubber plaster fastened to the thigh of the patient.

This instrument will cut its way through the bowel walls in from two to four days, and is then removed. It avoids the hemorrhage and soiling of peritoneum that go with older operations. It makes a door 2 1/2 inches long between ileum and sigmoid as soon as the devitalized tissue in the grasp of the jaws has become broken down by digestive or by saprophytic processes.

Some patients complain about the presence of the instrument in the rectum. This complaint is avoided if the sphincter ani is stretched moderately. Patients will complain about the frequent bowel movements, amounting sometimes to ten in the course of a day when contents of the ileum are first thrown directly upon an unaccustomed mucous membrane of the rectum. This mucous membrane may become irritated. Starch enemas promptly allay such irritation. At the end of a week or two, bowel movements commonly drop down to three per day, and after that are apt to occur from one to three times daily.

In these notes reference is not made in detail to my work with attic adhesions, which has been described elsewhere. Attic adhesions are so potent a factor in causing interference with motility of the pylorus, duodenum and hepatic flexure of the colon that they must be taken into consideration by surgeons who are dealing with the factors of disturbance described by Lane and by Jackson, otherwise there will be too many "unsatisfactory cases." All of this work which relates to adventitious tissues within the abdominal cavity is to open entirely new vistas in general medicine. Many cases of neuritis, neuralgia, psychosis, headache, "rheumatism," colitis, cholecystitis, diabetes, arterio-sclerosis, and in fact a long list of cases that were formerly held to belong to the internist only, are now to become joint charges of surgeon and internist. We are to have more and more demonstration of those toxic influences which depend upon intestinal bacteria, because the physical decline which goes with our response to the gregarious instinct will become more and more marked in all civilized countries as time goes on.

616 Madison Avenue.

THE DIAGNOSTIC AND THERAPEUTIC VALUE OF THE RENAL CATHETER.[1]

BY
K. I. SANES, M. D.,
Pittsburgh, Pa.

(With Twenty-five Illustrations.)

So frequently has the writer found in the renal catheter an instrument of great diagnostic and therapeutic value, that he felt justified in selecting it as a subject for a paper before this Society.

DIAGNOSTIC VALUE.

By the aid of a plain renal catheter, we are enabled to obtain separately the urine from each kidney for analysis, find the functional activity of each, investigate the renal pelvis so far as residual urine and renal capacity are concerned, and discover ureteral obstructions and their location. With the aid of the *x*-ray, the catheter can definitely diagnosticate and locate ureteral and renal stones (the *x*-ray information alone is frequently misleading); can give us ureterograms and pyelograms which show the abnormalities in the ureter demonstrate the size, form and position of the renal pelvis and frequently discover the cause of the renopelvic changes.

A RENAL URINE SPECIMEN FOR ANALYSIS.

The value of the renal catheter in obtaining a specimen of urine from a kidney is so self-evident that it hardly requires any discussion. An examination of a voided abnormal specimen of urine, containing pus, blood, etc., cannot locate the seat of pathology. It cannot locate it even with the assistance of a cystoscopic examination; for positive cystoscopic findings in the bladder do not exclude the kidney as a primary cause of the trouble, and negative findings do not indicate which of the kidneys is responsible for the abnormal constituents of the urine.

Observations of the ureteral ostia through a cystoscope or obtaining the kidney urines with a segregator may give us a great deal of information, but such information is neither complete nor always reliable. By the aid of the renal catheter we can study separately the urines of both kidneys and decide which of them secretes the abnormal urine or which of them is diseased.

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

FUNCTIONAL ACTIVITY OF THE KIDNEY.

By the catheter we not only obtain a urinary specimen from a single kidney for analysis, but the urine so obtained enables us to investigate the renal functional activity.

FIG. 1.

Before a nephrectomy is performed we must make sure that the better kidney of the two is capable of performing the functions of both. In other words, we must find out whether the functional ability of the healthy kidney is sufficient to take over the work of the diseased kidney. Nitrogen elimination test, chloride of sodium elimination test, benzoic acid, phloridzin, methylene blue, indigo-carmine, phenolsulphonephthalein tests, are now used to determine the efficiency of the renal function. While there are differences of opinion as to the relative value of these tests, there is hardly any question as to the necessity of a functional test in cases to be subjected to a radical kidney operation. The renal catheter passed into the healthy kidney supplies the urine for this important test.

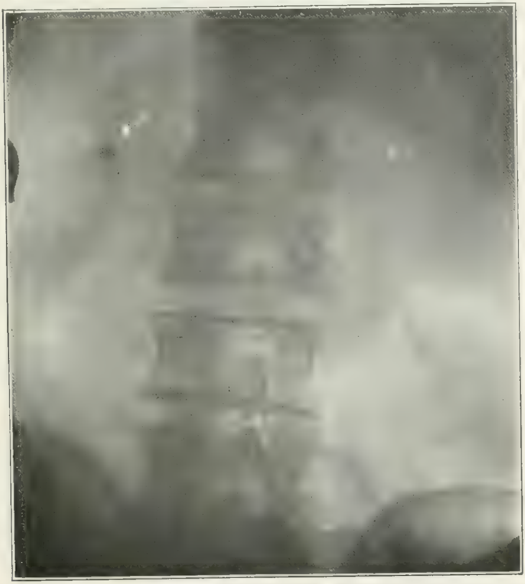

FIG. 2.

STUDY OF THE RENAL PELVIS; RESIDUAL URINE.

In our study of the condition of a diseased kidney, it is important to get all the possible information about its pelvis. By passing the catheter into the renal pelvis, we are enabled, first of all, to discover residual urine when present.

A normal pelvis of the kidney (by this we mean the surgical pelvis, *i.e.*, the anatomical pelvis *plus* the minor and major calices) holds about 4–5 c.c. of urine. It is never distended with urine to its full capacity, for it empties itself with each ureteral contraction. If, therefore, a catheter, introduced into the pelvis of kidney, causes a continuous outflow of urine of more than 5 c.c., we can take it for granted that we have in the pelvis residual urine. We must not, however, mistake a nervous polyuria for residual urine. Such a mistake can be avoided by remembering that in nervous polyuria the urine is pale and clear and its flow is not influenced by pressure over the kidney, while in the case of residual urine, the urine may be either turbid or clear, but of a deeper color, and its flow is accelerated by pressure over the kidney. The presence of residual urine is usually suggestive of a dilated pelvis, but the extent of such dilatation is best decided by testing for renal capacity.

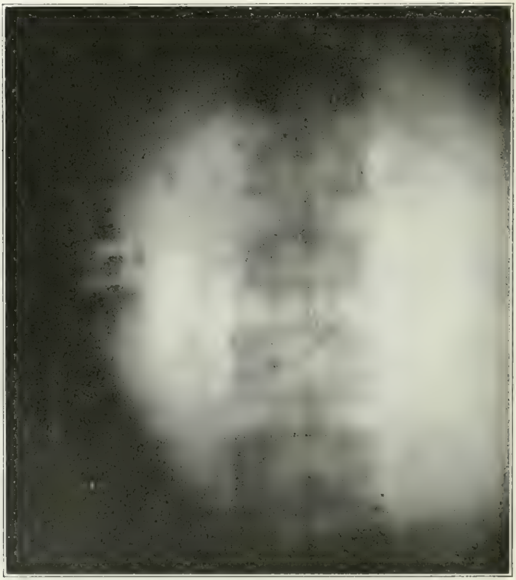

Fig. 3.

RENAL CAPACITY.

The renal capacity of a kidney or the degree of its dilatation can be found by injecting into the pelvis, through a renal catheter, a fluid to the point of tolerance. This point of tolerance is demonstrated by the sudden pain in the kidney and by the return flow from the ureter into the bladder (cystoscopic observation). The quantity of fluid injected before the appearance of pain gives us a definite idea as to the capacity of the kidney. A renal pelvis admitting more than 50 c.c. of solution is considered hydronephritic or pyonephritic, depending, of course, on the character of its contents. To get a good approximate idea about the capacity of a renal pelvis, we must make sure that the catheter is passed into the kidney.

FIG. 4.

(We can tell, as a rule, that the catheter is in the pelvis by observing a continuous dropping of the urine from the catheter instead of the intermittent flow that we see when the tip of the catheter is in the ureter.) This precaution is an important one, for if the tip of the catheter is in the ureter, pain will be induced as a result of ureteral dilatation, with a very small quantity of fluid.

The size of the catheter used for this test is also of importance. We must use a rather large-sized catheter to prevent the return flow of the fluid from the pelvis before its complete dilatation. In this connection we must remember that occasionally we meet a healthy kidney that resents an artificial dilatation with the smallest amount of fluid. Under this condition we are liable to be misled into the belief that we deal with a contracted pelvis. An injection of a safe amount of a solution of novocain will easily clear up this difficulty for us. On the other hand, we may meet occasionally a relaxed pelvis in a nervous patient that admits large quantities of fluid

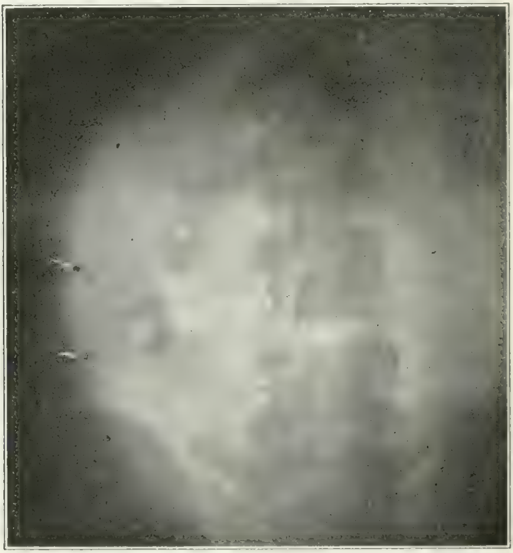

FIG. 5.

without any discomfort, although the kidney is perfectly normal otherwise. Such cases, however, are exceedingly rare.

DIAGNOSIS OF OBSTRUCTION IN URETER.

One of the most valuable uses of the renal catheter is that of a searcher to discover the location and character of ureteral obstructions. Normally, after entering the ureteral opening, the catheter should encounter no difficulty in its passage toward the pelvis. It is true that the point of the catheter may be caught in the normal

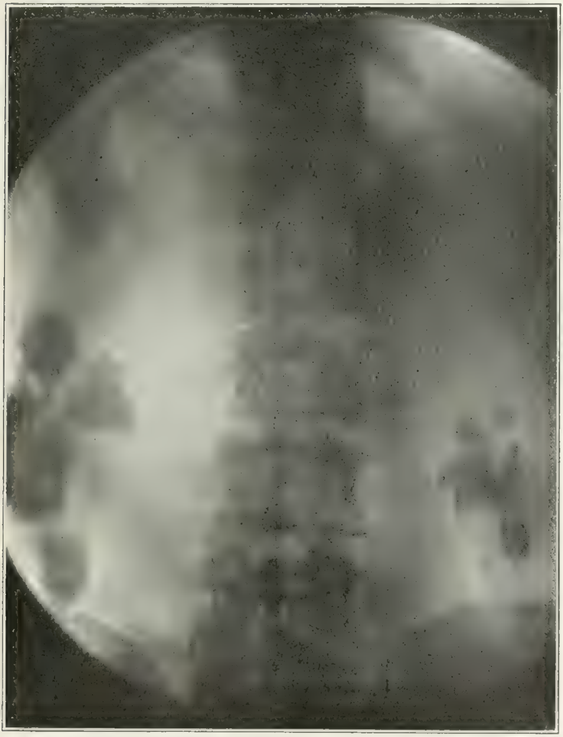

Fig. 6.

mucous membrane of the ureter and give us an impression of obstruction, but repeated up and down motions of the catheter, as well as an injection of water or oil, will usually allow the passage of the catheter. If, on repeated examinations, the catheter is arrested at the same distance from the ostium of the ureter, the diagnosis of obstruction can be definitely made and the seat of the difficulty exactly located by the graduated catheter. A ureteral obstruction may be caused (1) by foreign bodies within the ureteral channel, such as calculi, blood or pus clots, accumulations of urinary salts, etc.; (2) by changes within the ureteral walls, such as strictures, kinks, twists, valves, diverticulæ, and (3) by pressure from without such as inflam-

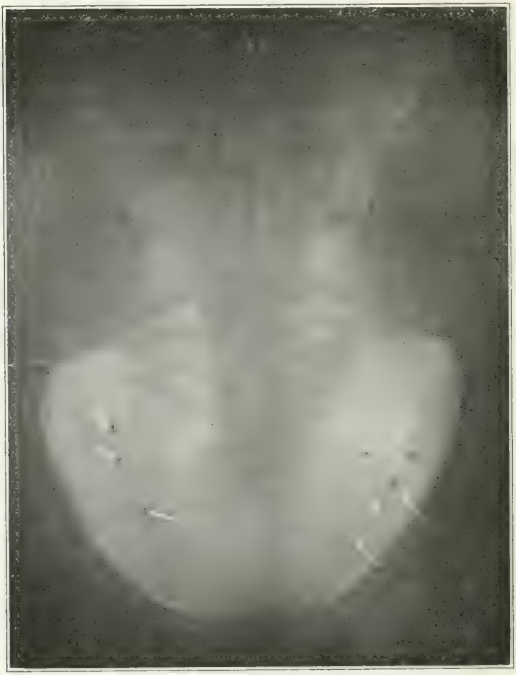

FIG. 7.

matory exudate surrounding the ureter (parametritis, tubo-ovarian abscess, etc.), anomalous blood-vessels crossing the ureter near the pelvis, tumors, etc. The renal catheter can discover the presence of an obstruction, but unaided it does not, as a rule, discover the kind of the obstruction. A wax-tipped catheter, used through an endoscope in a female may discover a calculus by the marks upon

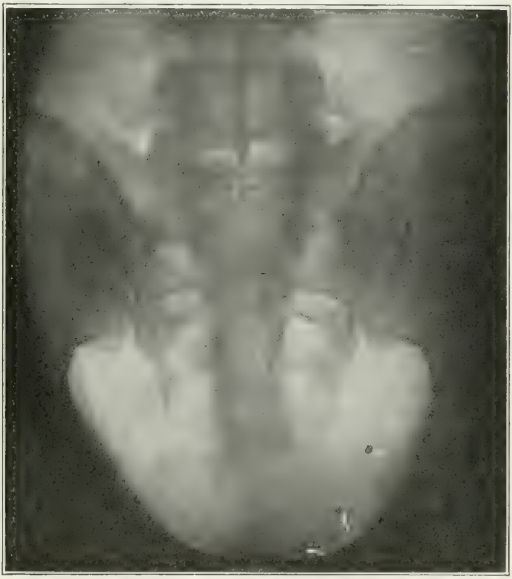

FIG. 8.

the wax; an ordinary catheter may discover obstructing blood clots, pus clots and accumulations of urinary salt by carrying off particles of them through its lumen. As a rule, however, the assistance of the *x*-ray must be obtained to differentiate the kinds of obstructions.

DIAGNOSIS OF CALCULI.

A renal catheter opaque to the *x*-ray, when inserted into the kidney and radiographed, demonstrates the course of the ureter and locates the pelvis. Such a catheter is especially valuable in nephrolithiasis and ureterolithiasis, the diagnosis of which is usually difficult. While the *x*-ray is widely used in examination for renal and ureteral stones, it does not always definitely settle the question. It frequently fails to give a shadow of calculi in stout people or in people presenting an abnormal opacity to the rays. It fails to demonstrate uric-acid stones even in thin people. (Here a wax-tipped catheter is very useful.)

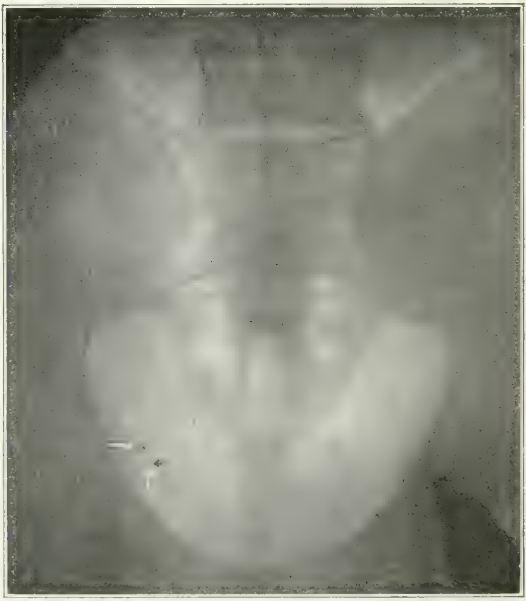

FIG. 9.

Again, the *x*-ray plate* may show shadows of phleboliths, fecal bodies, calcified glands, and old inflammatory connective-tissue formations that may be easily misinterpreted as calculi. There are unquestionable shadows that can be correctly diagnosticated as renal calculi without a catheter. Take plates Nos. 1, 2 and 3, they show pictures of foreign bodies which in their shape and location quite definitely determine the presence of renal stones, but take No. 4 and you cannot be certain whether all the foreign bodies are stones, and they are, whether they all are in the pelvis. The same holds good of plate No. 5. Again take Plate No. 6, with four shadows on

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* The radiograms of this article were taken by Dr. Geo. W. Grier, Roentgenologist of the Western Pa. Hospital.

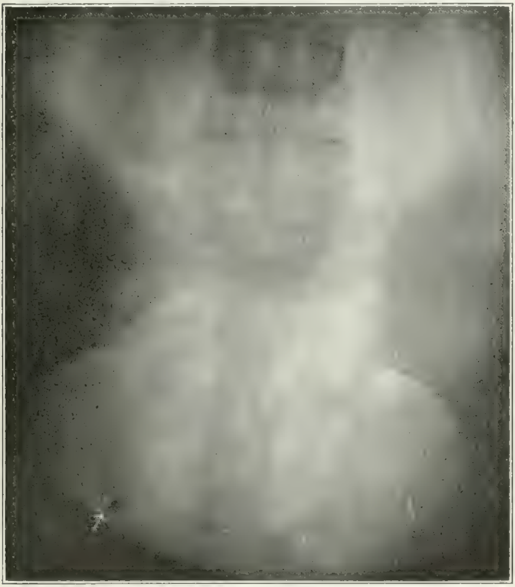

FIG. 10.

right side and one on left. The innermost shadow on the right side was found on operation to be a stone, the other three on the same side, and the one on the left, were the remnants of a bismuth meal in the colon.

The diagnosis of calculi on *x*-ray plates is especially difficult when they are located in the lower third of the ureter and 70 per cent. of the ureteral stones are found there in the neighborhood of the pelvic veins. The difficulty in diagnosis of these stones is due chiefly to the phleboliths so frequently met there in these pelvic veins. In at least 25 per cent. of all the Western Pennsylvania Hospital pelvic radiograms, examined by the writer, phleboliths were found. Theoretically, there should be no difficulty in distinguishing phleboliths from ureteral stones, but practically it is

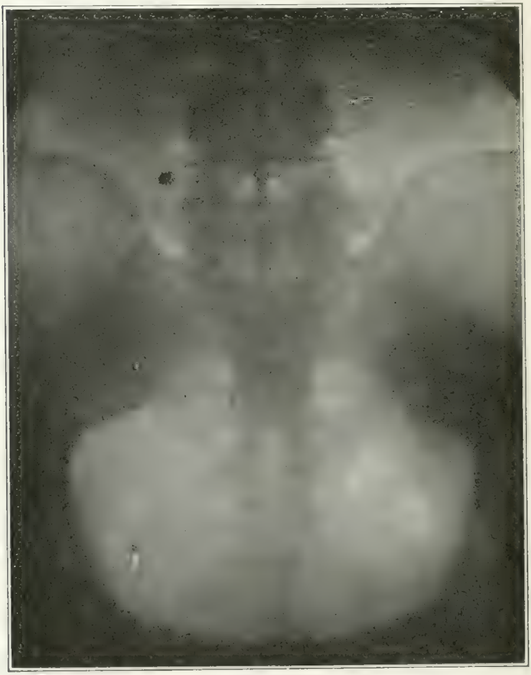

FIG. 11.

not always so easy. White plates Nos. 7, 8 and 9 show unquestionable shadows of phleboliths, we cannot be certain of. Calcified glands and foreign bodies in feces may show such shadows. Even a ureteral inflammatory infiltration may give a shadow resembling that of a calculus. In one of the writer's cases referred to him by Dr. G. Feldstein, a round, small body was found in the lower portion of the right ureter, causing an obstruction with accompanied pyonephrosis. The history suggested a periureteral and ureteral infiltration, but the radiogram, which was unfortunately lost, gave such a perfect picture of a big ureteral calculus, that a diagnosis of ureteral lithiasis was made by the röntgenologist in spite of the history. An incision into the ureter through the vaginal wall demonstrated the thickly infiltrated hard ureteral wall.

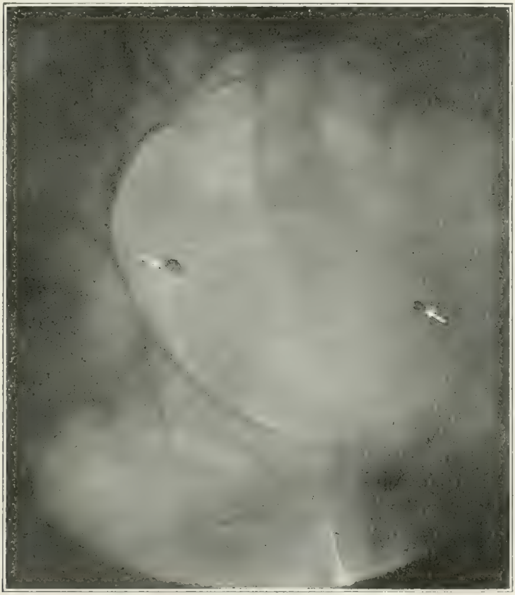

FIG. 12.

In general, a statement can be made that the information given by an x-ray plate in renal and ureteral lithiasis is frequently uncertain. Anything, therefore, that can show on the x-ray plate the relation of the shadows to the lumen of the ureter can assist us in correctly interpreting these shadows. A renal catheter opaque to the x-ray, passed into the kidney pelvis and radiographed, can define this relative position of the ureter and renal pelvis to the stone.

The catheter used for this purpose is either a styletted one (lead or fine silver wire being used in it), as in plate 13, or a specially manufactured one for *x*-ray purposes as in plate 14. The *x*-ray catheter gives a heavier shadow, and, at the same time, allows a freer flow of urine; the styletted catheter gives a better picture of the ureteral stone because the catheter material, being transparent to the *x*-rays,

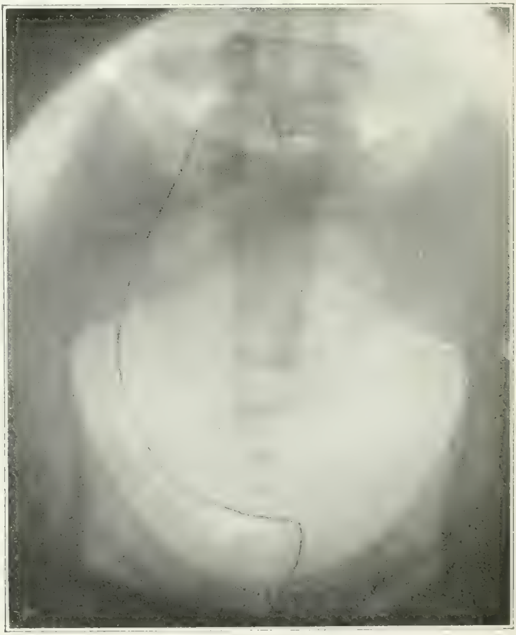

FIG. 13.

leaves a clear space of the thickness of its wall between the shadow of the wire and that of the stone. But whichever catheter is used, when a shadow resembling a stone is seen on an *x*-ray plate along side the shadow of the catheter, a positive diagnosis of stone can be made.

The plate No. 15 shows a shadow of a ureteral stone in immediate proximity of an *x*-ray catheter. The stone is small, and if it was not for its contact with the catheter shadow, the diagnosis of stone could hardly have been made.

The value of such findings will be especially appreciated when we bear in mind the fact that not infrequently the symptomatology of a ureteral calculus is not definite, that usually the pain is irregular and vague; that not infrequently the pain is reflected to the opposite side, and that the disturbances caused by ureteral calculi may be mistaken for those of appendicitis, tuboovarian disease, gall-bladder disease, etc.

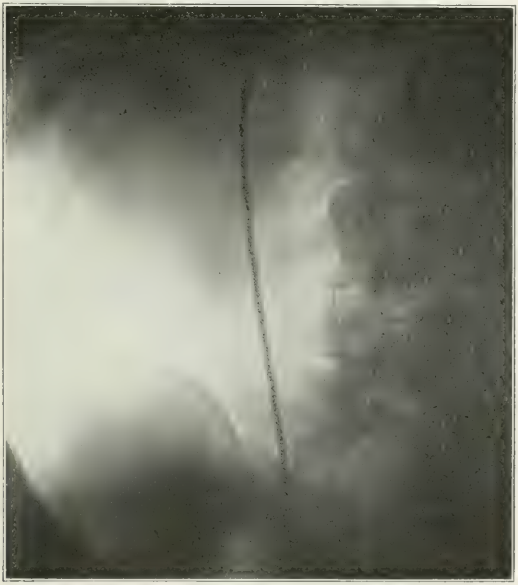

FIG. 14.

SHADOWS OF PELVIS AND URETER OBTAINED BY PYELOGRAPHY AND URETEROGRAPHY.

A catheter opaque to the x-ray, while locating the renal pelvis, cannot give us its size or shape. But there is frequently a great need for such information, especially when we have under consideration the question of a radical operation on kidneys. Such information can be supplied only by pyelography, *i.e.*, radiography of renal pelvis dilated to its capacity by fluid opaque to the *x*-rays. The fluid generally used is a collargol solution (5 per cent.-10 per cent.) because it is astringent, antiseptic, and nonirritating, and because its color enables us to observe through a cystoscope its return flow

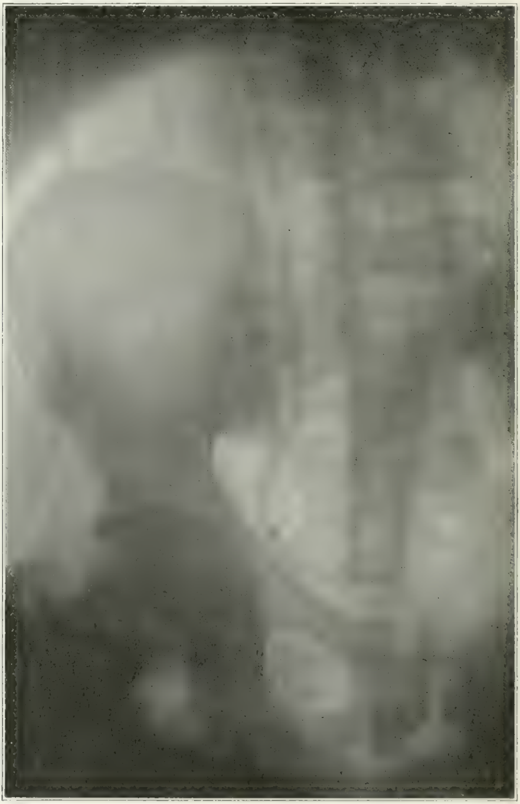

Fig. 15.

into the bladder. To obtain a pyelogram, a catheter is passed into the renal pelvis. The writer uses 1-ounce-soft-rubber bulb syringe which is filled with the collargol solution and into which is inserted a dull hypodermic needle. The point of this needle is connected with the renal catheter. (Fig. XVI.) By making moderate pressure on the bulb, the fluid is slowly forced into the pelvis of kidney until the patient experiences pain, or the fluid begins to flow into the bladder.

While injecting the collargol care must be taken not to use any violent force.

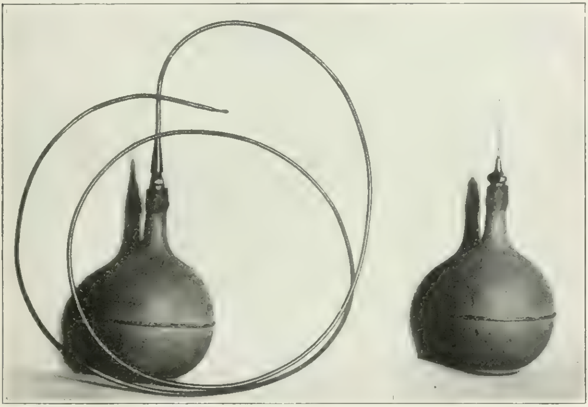

Fig. 16.

A number of authors have observed eroded and necrotic areas in the pelvis as well as discolored and ruptured tubules from the careless distention of the renal pelvis. When the solution is injected in proper amount and under proper pressure, no such injury to the kidney or pelvis should occur. The careful experiments of Strassman on rabbits have proven this.

As soon as the renal pelvis is distended to its full capacity a pyelogram is taken. The picture thus obtained shows the size of the pelvis (dilated, contracted or normal), its form (shape of the pelvis and its calices) and position (horseshoe kidney or displaced kidney). In the hands of a good radiographer the picture of the renal pelvis is correct, clear and well defined. Of course, the irritable and relaxed kidneys referred to above will occasionally give a misleading pyelogram to the most skillful röntgenologist.

The value of pyelograms is mostly appreciated when it is desirable to obtain an idea about the extent of an operation to be undertaken for a badly diseased kidney. In slide No. 17, we see a large stone in the pelvis of the kidney. There was pus in the urine, but the patient was not complaining much of the kidney. In such a case nephrotomy may be promised, but No. 18, pyelogram of this same patient, shows a very much dilated pelvis with a dilated ureter and with such findings a radical operation must be preferred. The value of a pyelogram is very frequently greatly enhanced by the uretero-gram (the shadow of the renal catheter carrying the collargol to the pelvis.) This shadow frequently shows abnormalities of the ureter that a styletted or *x*-ray catheter cannot demonstrate, such

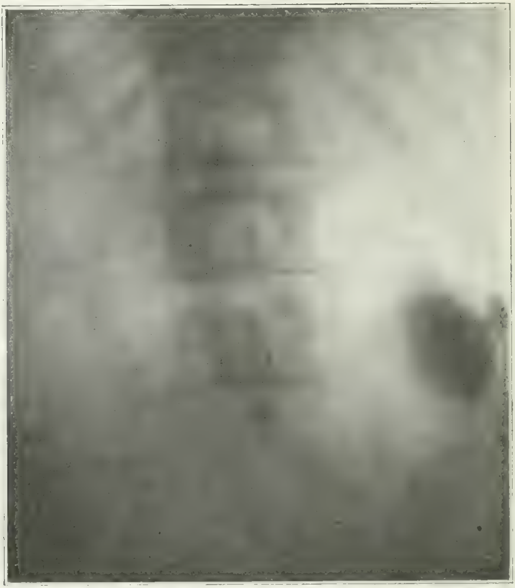

FIG. 17

as dilated or contracted ureters, ureteral kinks, high insertion of the ureter into the pelvis. Thus we can by taking a ureterogram with a pyelogram find not only the pathological condition of the pelvis, but find the cause of the difficulties and gain helpful hints for the proper surgical procedures. The following plates bring out clearly this point.

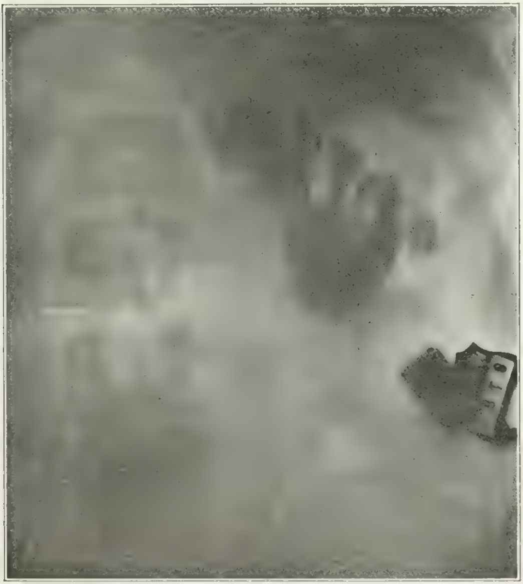

FIG. 18.

Plate No. 19 shows a catheter that met an obstruction in the ureter. The character of the flow of the urine indicated the presence of the catheter in the ureter.

Plate No. 20 shows the pyelogram of the same patient. The pelvis is found dilated. The ureter is shown kinked at the entrance into the pelvis. This picture then shows the pathology and etiology of the abnormal kidney and clearly outlines the character of the operation.

Plate No. 21 showing an x-ray catheter passed into ureter to a point near the renal pelvis. It could not be forced up higher and the flow of urine indicated that it had not reached the pelvis. Number 22 is a pyelogram of the same patient and shows the dilated pelvis and also a dilated ureter above the seat of stricture. The cause, therefore, of the pelvic dilation in this case is the stricture of the ureter at its upper third. Thus the diagnosis is clear and treatment in this case, as in the preceding one, is clearly indicated by the ureteropyelogram.

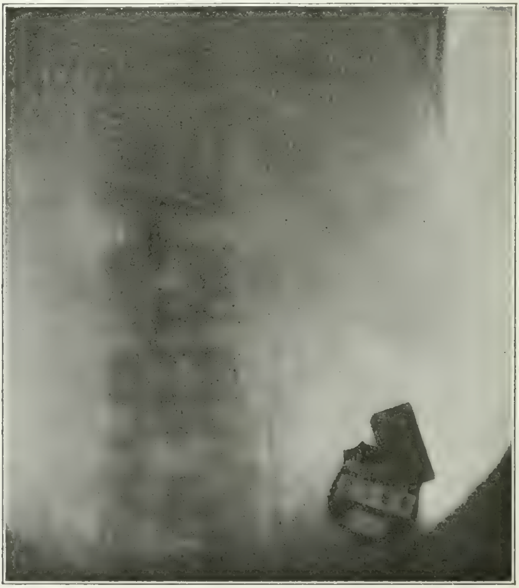

Fig 19.

Plate No. 23 shows a large loop of a renal catheter in the pelvis turned downward, indicating a high insertion of the ureter into the pelvis; and plate No. 24 of the same patient shows a dilated pelvis with its dilated calices below the insertion of the ureter. The high insertion of the ureter, interfering with the complete emptying of the renal pelvis, is responsible for urinary retention (residual urine) and pelvic dilatation. Plate No. 25 is a similar pyelogram of another patient.

These plates fully explain the pathology of the kidney and plainly outline its surgical treatment.

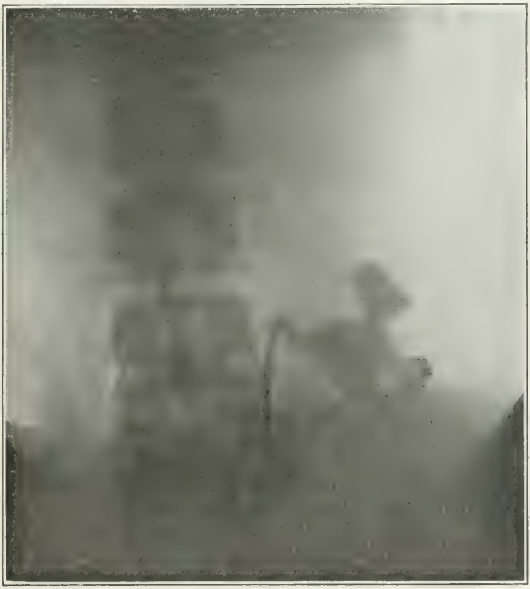

FIG. 20.

THERAPEUTIC VALUE OF THE CATHETER.

So much for the diagnostic value of the ureteral catheter. But the catheter has also a great therapeutic value. By its aid we can frequently relieve ureteral obstructions, facilitate certain operative procedures, establish kidney drainage and conduct renal lavage and treatment.

RELIEF OF URETERAL OBSTRUCTION.

The greatest value of the ureteral catheter is seen in the treatment of ureteral obstruction. The obstruction caused by the changes within the walls of the ureter, by pressure on the walls from without and by foreign bodies within the ureteral lumen, can either be permanently cured or temporarily relieved by the catheter. The most common form of obstruction caused by changes within the ureteral walls are, in our experience, the strictures, and the renal catheters or bougies are the best instruments for their dilation. The attempt to dilate a stricture in the upper third of the ureter may

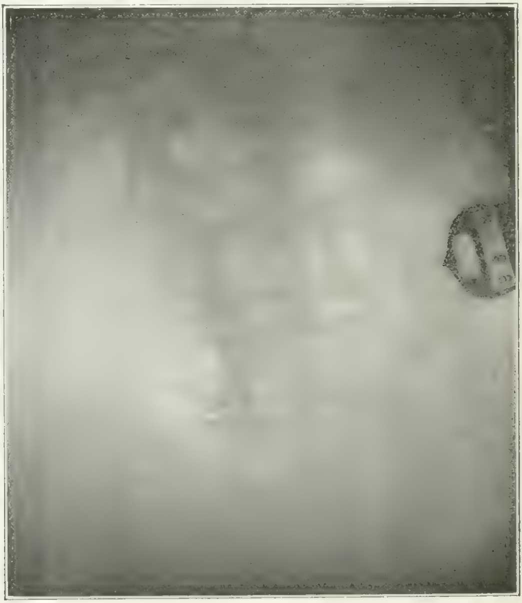

Fig. 21

not be successful and may even be dangerous in the hands of an unskilled cystoscopist. But ureteral structures are very rarely found there. They are usually met in the lower third of the ureter, where they develop as a result of ascending infections from the bladder or as a result of pelvic inflammations in the surrounding tissues. The strictures in this location can be very safely dilated by successive sizes of catheters or bougies.

The obstructions in the upper portion of the ureter are most commonly caused by kinks, twists, diverticula and valves. There is not, as a rule, much difficulty met by the catheter in passing these obstructions from below up. The injurious effects, therefore, caused by such modes of obstructions can be easily relieved by draining the dilated ureter and pelvis through the renal catheter, although the permanent correction of the obstruction cannot be carried out by the catheter.

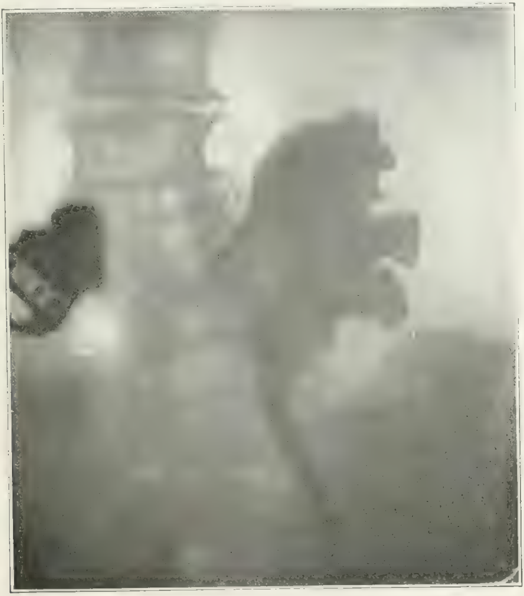

FIG. 22.

The same holds good in a case of an obstruction of the ureter caused by pressure from without (exudates, tumors, pregnant uterus, anomalous vessels, etc.) While the cause of obstruction cannot be removed by the catheter, the relief obtained by ureteral catheterization is very great. By relieving the dilatation of the ureter and pelvis of kidney (emptying the urine or pus) we can keep the organ in good condition until the cause of the obstruction is relieved by operation (tumor or exudate), absorption (exudate) or delivery (pregnancy). The relief, thus obtained, is frequently most striking; it is especially so in the infected dilated kidneys of pregnancy.

The use of the catheter in obstruction caused by foreign bodies within the lumen of the ureter is of still greater value. A calculus descending in the ureter and grasped by the musculature in a position unfavorable for its passage may be helped in its descent by the catheter. The catheter is passed to the point of obstruction and a solution of cocain is injected to relax the ureteral wall, and then sterile olive oil is gently forced into the catheter to dilate the ureteral lumen. Such dilation may change the position of the stone to a more favorable one for its descent. Occasionally the withdrawal of the catheter passed above the seat of the stone will carry the

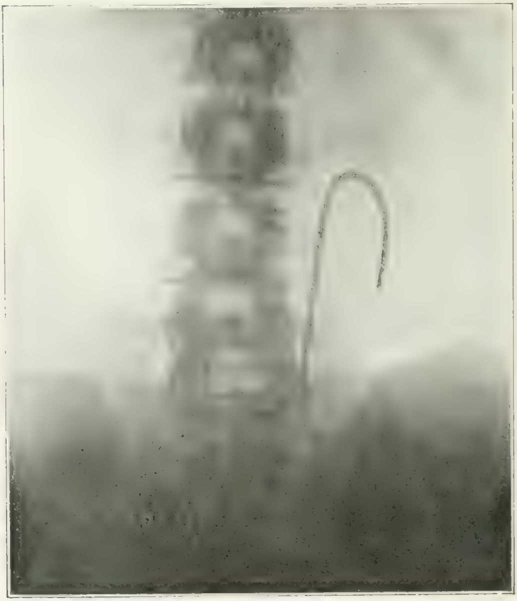

FIG. 23.

stone down into the bladder. This result of catheterization was obtained by the writer in a case of ureteral stone referred to him by Dr. J. N. Stanton. This patient was admitted for renal colic. An *x*-ray catheter was passed into the renal pelvis and radiogram taken. The stone was found on the plate lying about 3 inches above the ostium. On the removal of the catheter the stone was carried into the bladder.

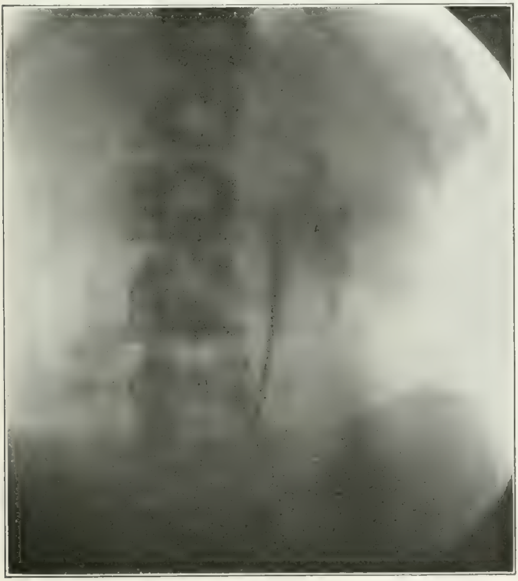

FIG. 24.

The other foreign bodies in the ureteral lumen, easily removed by catheter, are pus clots, blood clots and accumulations of urinary crystals. These obstructions are exceedingly interesting for the ease with which the relief is brought to the patient by catheterization. The catheter forced through the obstructions breaks up easily the obstructing material which is then carried off in small particles by the catheter or by the ureter after removal of the catheter. It might not be out of place here to cite briefly three cases, one for each of the three kinds of foreign-body obstructions mentioned.

Mrs. E. W. H., a case of bilateral tuboovarian infection with extensive adhesions, referred by Dr. J. W. Boyce, Dec. 22, 1903, for bilateral salpingo-oophorectomy. The patient had pyuria before operation. On the third day after operation both kidneys were found very much enlarged. The patient then began to suffer with pain in both kidneys and with an intermittent anuria (bilateral pyonephrosis). The left kidney soon improved, while the right one continually annoyed her. Catheterization of the kidneys was recommended by the writer, but it was not agreed to. Five months after the operation the patient became semiconscious and remained in this condition for about a week. Eight months after operation, while still in hospital, catheterization was consented to. The catheter found the obstruction in the lower third of the right ureter, which, after considerable manipulations, was passed. A purulent urine, with pieces of clotted pus came through the

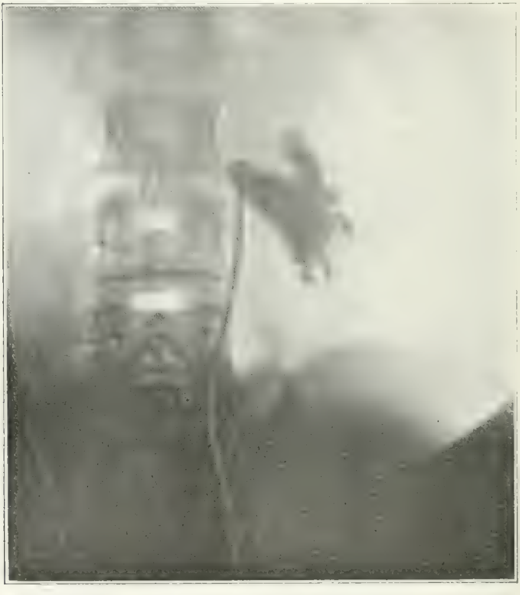

FIG. 25.

catheter with immediate relief. The patient left the hospital the following week. Within two years after the discharge from the hospital she had to be catheterized twice for the same obstruction by pus clot. The patient was seen by the writer about eight months ago, eight years after the last catheterization. She never had attacks since the last treatment, is perfectly well, and her urine is normal.

Miss McC., twenty-four years, referred by Dr. F. Morgan, Braddock, April 24, 1905. She had five attacks of renal colic within three days, beginning in the right lumbar region and shooting toward the bladder. Morphine gave no relief. The patient gave a history of a similar attack on the left side four years before. Nephrolithiasis was suspected. The right ureter was catheterized and found obstructed. The left ureter was catheterized, but no urine was obtained for eight hours (sympathetic anuria.) After the left kidney began to secrete urine a number of attempts were made to pass the obstruction in the right ureter. A small-sized catheter was finally passed through the obstruction. A free flow of urine with small pieces of black clotted blood passed through it. Immediate relief followed. The writer saw her at his office three months ago. She never had an attack since the catheterization.

Mrs. R. B., Blairsville, Ohio, patient of Dr. L. S. Clagget, seen August 1, 1906. She gave a history of frequent left-sided pelvic pain of seven years standing. They were colicky in nature, lasting two to six hours at a time. The pain came once or twice a week. She lost 40 pounds during the seven years. On examination, the left vaginal portion of the ureter was found thickened and hard. A catheter could not be passed. The lower stenosed ureteral portion was dilated with successive sizes of bougies. With a small catheter the obstruction was then passed. Clear urine came freely from the catheter and with it a pure white phosphatic sediment. The base of bladder was found strewn with the same clear white gravel. Immediate relief followed. While the phosphatic sediment accumulations caused the patient's attacks of pain, it is questionable whether this sediment could have caused the obstruction in a normal ureter. After the dilation of the ureter the patient's attacks stopped. The patient was seen by the author two years ago. She was in perfect health.

FACILITATES OPERATIVE PROCEDURES.

The ureteral catheter is frequently made use of in operative surgical procedures, as a safety guide for the ureter.

During operations on pelvic organs necessitating wide dissections, such as in cases of carcinoma of the uterus, broad ligament tumors and exudates, the catheter clearly outlines the ureters, thus protecting them from injury. Many an injury to the ureters could be avoided if this precaution of a preliminary insertion of catheter had been practised. This precaution is especially valuable in cases of dislocated ureters.

In operating on injured ureters the renal catheter assists in discovery of the injuries and facilitates their correction. In case of ligated or cut ureter the catheter exposes for us the lower part of the ureter and greatly facilitates the approximation of parts.

RENAL DRAINAGE FOR FISTULA.

A great assistance is rendered by the catheter in closing a renal fistula. It may be kept in the renal pelvis for days, thus establishing urinary drainage in natural direction, and promoting the closure of the fistula.

RENAL LAVAGE AND MEDICATION.

In some diseases of the renal pelvis the catheter can be used with excellent results for renal lavage. The catheter is inserted into the renal pelvis and solutions such as boric acid, silver nitrate, argyrol or collargol are injected. Such lavage can be used in chronic ascending catarrhal pyelitis, especially of gonococcus or colon bacillus origin.

In case of hydronephrosis the fluid can be gradually drawn off and in pyonephrosis, by the aid of the catheter we may drain off the pus and treat the pelvis with antiseptic solutions. Such treatment in favorable cases of hydronephrosis or pyonephrosis is frequently followed by a complete cure. In unfavorable cases, the patient's general condition can be greatly improved preliminary to operative procedures.

Even in renal hemorrhages the catheter has been put to good service. Cases have been reported in which adrenalin injection arrested such hemorrhages. Of course, the cause of hemorrhage should, if possible, be investigated before such treatment is undertaken.

We see, then, that the value of the ureteral catheter in diagnosis and treatment of urological disease is well established. It behooves us all to make use of it more frequently than it has been our custom in the past. To some of us ureteral catheterization seems a difficult procedure; to others a dangerous one. It should be neither dangerous nor difficult in the hands of men practising the surgery that we do. Those of us who have catheterized thousands of ureters have learned not to fear infection from its use, and have gradually extended the field of its application with great satisfaction to themselves and great benefit to their patients.

Jenkins Building.

RENAL AND URETERAL CALCULI.[1]

BY
HENRY DAWSON FURNISS, M. D.,
New York City.

(With Fifteen Illustrations.)

I shall first present histories of my cases, then an analysis, and finally my conclusions.

CASE I.—Referred by Dr. Guion of New Rochelle; thirty-four years old, seen first on December 6, 1912. Has had four children, the last born August, 1912. Since the birth of this child she has had some backache and difficulty in walking. In the middle of November, 1912, she noticed that her urine was of a port wine color for eight days from admixture of blood. This cleared and was noticed again on December 3, though not so much as before. When seen by me there was no blood in the urine and cystoscopy failed to show any vesical cause for hemorrhage and the ureters appeared normal.

In October, 1912, she had severe pain in abdomen and back for eighteen hours, but no more on one side than the other.

Radiograms of the urinary tract show a medium-sized stone in one of the lower calices of the left kidney. Unless the pain in October was due to the calculus, this patient had only her hematuria to call attention to the presence of trouble.

I advised that the size of the stone be determined from time to time radiographically, and that unless there was an increase, or more hematuria or other troublesome symptoms, that she be not operated (Fig. 1).

CASE II.—Referred by Dr. K. K. McAlpine, of New York.

Seen first on April 11, 1911. For several years this patient had been suffering from pain in the left renal region, which was relieved by the recumbent posture, to return when up and about. The urine contained a small amount of pus and blood. Radiographs showed the shadow of a small round calculus, which at operation proved to be in the renal pelvis. This was removed by incision in the pelvis posteriorly. The pelvis was closed with fine catgut suture and there was no leakage afterward. There has been no trouble since the operation. This small stone, situated as it was and ball-valving the ureter when the patient was erect, caused a great deal of distress (Fig. 2).

CASE III.—Referred by Dr. John Van Doren Young of New York. Seen first October 27, 1911. Aged thirty-eight. In October, 1910, had severe pain in the left side of abdomen just within and below anterior superior spinous process; this was preceded for twenty-four hours by some soreness in this region. The pain lasted four hours and morphine by hypodermatic was necessary for relief. There was no further trouble until October 18, 1911, when there was severe pain for twelve hours; there has been much soreness since. Shortly after the first attack it was noticed that the urine was turbid. It showed a moderate amount of pus.

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

Radiographs showed a branched stone in the left kidney, the projection going upward into one of the calices (Fig. 3).

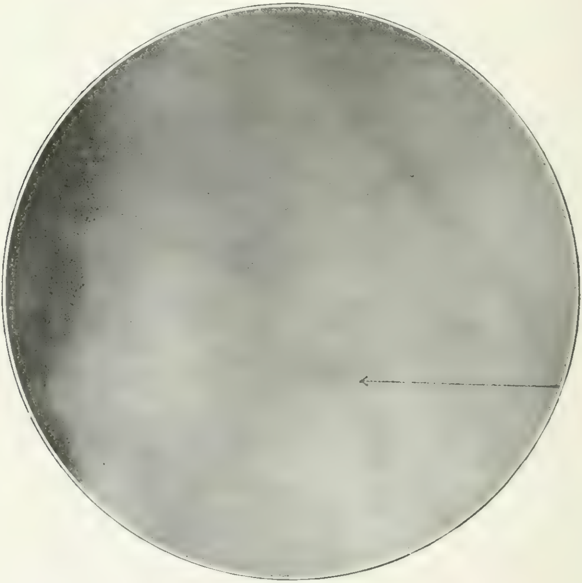

Fig. 1.—Case I.

On November 3, 1911, I removed the stone through an incision in the posterior aspect of the pelvis, which was sutured. For forty-eight hours urinary drainage was considerable, very little in the third twenty-four, and after that none. Patient made an uneventful recovery and has had no further trouble.

This patient had a rather large calculus which had evidently been present for some time. The pain was always over the middle portion of the ureter, yet there was no history of the passage of portions of the calculus, nor were any found radiographically.

Case IV.—Referred by Dr. D. W. Cairns of New York. Seen first on March 4, 1906.

In 1898 noticed for the first time that the urine was turbid; this has persisted until the present. In 1903 passed an oblong, hard stone, which was quite rough. Had been suffering much with colicky pain in the right renal region for six years previously. Since the passage of the stone has had pain in that side, but no colics. Both ureters were catheterized, and purulent urine obtained from the right. Lavage of the renal pelvis helped, but did not clear up the pyuria. Radiography showed a calculus in the right kidney, Patient refused operation and was lost sight of. When seen by me. this patient complained of only moderate discomfort and pyuria.

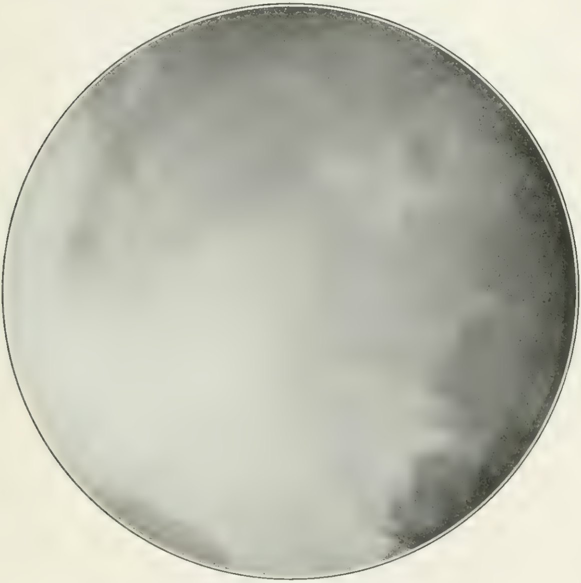

Fig. 2.—Case II.

Case V.—Referred by Dr. Edward Quintard, of New York. This patient was first seen in June, 1909, on account of pyuria. She was forty years old, a widow, who had never had any children. In 1900 her maid told her that the urine in her chamber was turbid and suggested that it be examined. It was found to contain a large amount of pus. She had no frequency of urination. She had for a short time only mild pain in the lumbar region, no more marked on one side than the other. Was treated for years with bladder irrigations without benefit. Radiographs showed four large stones in the region of the left kidney. At operation it was found that the kidney was the size of a grape fruit, with very little renal tissue left. Nepherotomy.

This patient had four enormous stones in the left kidney that had practically destroyed it, and the only symptom of which she had complained was pyuria, and this did not bother her other than by the knowledge of its presence.

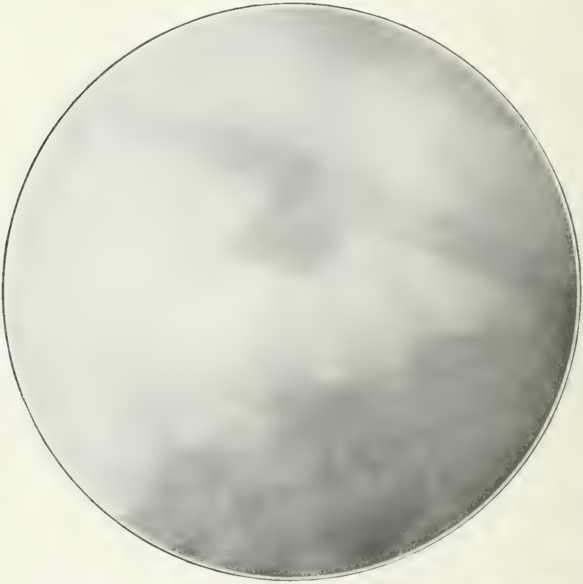

Fig. 3.—Case III. Stone in pelvis of right kidney with a projection upward into a calyx.

Case VI.—Referred by Dr. Guion, of New Rochelle. This patient had some pain in the left renal region for a short time after the birth of her only child in 1895. Since 1907 she had had attacks of pain in the left renal region, associated with temperature, nausea and vomiting. These have come on several times a year, the last one starting April 23 and persisting for five days. During this time she had frequency of urination and noticed some blood and pus in the urine. In Feb., 1912, she passed some gravel.

When seen by me she was having pain in the left renal region and had a temperature of 101°. Examination of the bladder urine showed a large amount of blood and many pus cells. Cystoscopy revealed a mild cystitis. Through ureteral catheters urine was obtained. That from the left showed a small amount of pus and 0.6 per cent. albumin, no elimination of phenolsulphonephthalein after one hour's observation. That from the right showed a small amount of pus, much blood and 0.2 per cent. albumin, and 28 per cent. phenolsulphonephthalein in one hour.

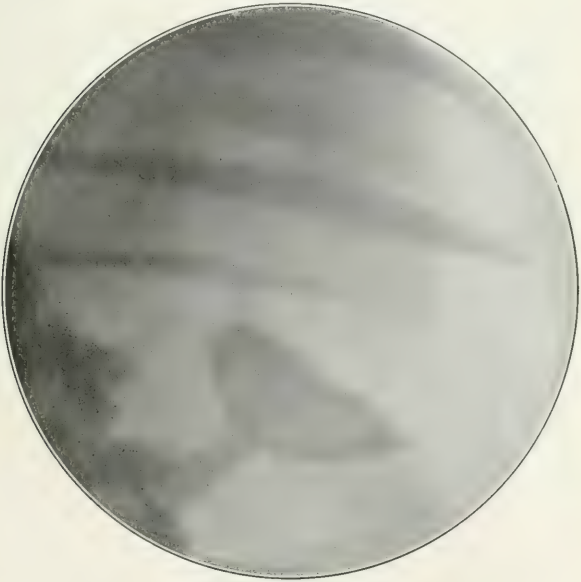

Fig. 4.—Case IV. Two stones in right renal pelvis.

Radiographs showed two large stones in the pelvis of the right kidney (Fig. 4). Because of the symptoms referable to the left side and the low phenolsulphonaphthalein output another catheterization of the left ureter to the renal pelvis was done and 10 ounces of urine collected in a steady flow.

The stones in the right kidney were removed by posterior pelviotomy and the pelvis was not sutured. There was drainage for seventy-two hours, during which time 12 ounces of urine in twenty-four hours was collected. After the cessation of the drainage 80 to 90 ounces were obtained from the bladder in each twenty-four hours. For the first three days after operation there was excessive thirst and vomiting. On the fourth day she became irrational, more so on the fifth, and died on the sixth from renal insufficiency.

Here is a case where the presence of shadows of stone in the right kidney with a history of left pain might have led one to suppose that the pain was of reflex origin. Had it not been for the low output of phenolsulphonephthalein that made me make another examination, I might have overlooked the 10-ounce hydronephrosis. In this case my plan of treatment was to put the right kidney in good condition and afterward to remove the left.

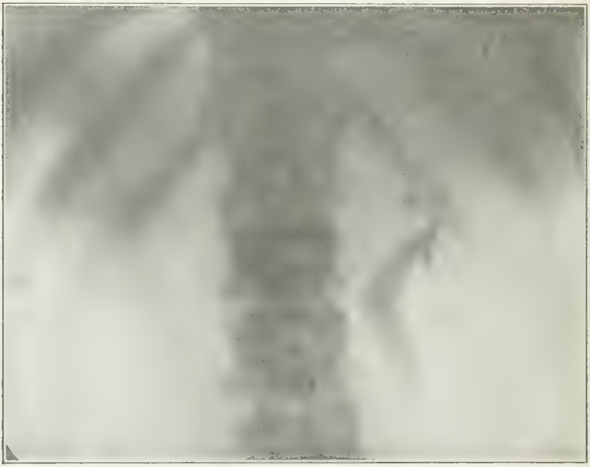

FIG. 5.—Case VII.

CASE VII.—Referred by Dr. Guion, of New Rochelle. Seen first in January, 1913. Since 1900 has had some frequency of urination and gets up three or four times at night to pass urine.

In November, 1912, after lifting a heavy chair, she had sudden acute pain of a few minutes' duration in the right renal region. That night there was a chill and rise of temperature, the temperature lasting a few days. In December she had temperature for several days, but with no pain.

Patient never noticed turbidity of the urine until she had an attack of quinsy in January, 1912, when her physician discovered much pus.

Except for a slight trigonitis, the examination of the bladder is negative. The urine from the left kidney is clear; that from the right contains a large amount of pus from which colon bacilli were isolated in pure culture. The ureteral catheter is obstructed at 9 inches. Radiographs show two large calculi, end to end, the lower extending down into the ureter and the upper into the upper calices of the kidney. There are shadows of several smaller stones scattered through the calices (Fig. 5).

Indigo-carmine injected intramuscularly appears strong from the left kidney in twelve minutes, the interval between spurts being thirty seconds and the ejection lasting five seconds. On the right it appeared in the same time but only faintly; on this side the spurts were without vigor, but lasted fifty seconds with ten seconds interval.

On January 17, 1913, I cut down on the right kidney, which was slightly prolapsed, and only slightly enlarged. The adhesions were not marked. As the kidney appeared to contain a large amount of normal appearing tissue, I removed the two large stones through the posterior incision in the pelvis, and several of the smaller ones by incisions in the cortex. The pelvis was not sutured. Urinary leakage for only seventy-two hours.

The patient made a good recovery, but within two months after operation passed three stones, and continued to have her pyuria.

Since operation she has had some pain in the right renal region, and as the pyuria persisted and the functional capacity of that side has not improved, I advised nephrectomy. She went to someone else with less radical views and I lost sight of her.

Surely these calculi have persisted for a long time and yet there was only one attack of pain. The pyuria, which was also probably of long duration, was not noticed until it was found in a routine examination by her physician.

Case VIII.—In December, 1905, I saw this patient for the first time. She was then forty-one years old. Right after the birth of her only child, twenty-two years previously, she had some burning and difficult urination. An examination at this time revealed a small growth at the urethral orifice. This has continued to increase in size. In 1890 she began to have frequent and burning urination, and some difficulty in passing water, all of which became worse after 1900. Since 1904 she has frequently an imperative desire to void urine, but it is often some time before she is able to pass it. She claims that she has had pain in the right lumbar region since 1897.

When I first saw her there was a small growth to the right and below the urethra, the nature of which was not determined, that caused difficulty in passing the cystoscope. She had a mild chronic cystitis and purulent urine coming from both kidneys. On the right side I was able to obtain a scratch mark on the catheter on two occasions, and it was judged that at the time she had a calculus in the upper end of the right ureter. She refused to be radiographed.

I saw her again in June of this year, and she is in just the same condition as when first examined. When taking urotropin she is able to keep down the amount of pus and feels well. Has never had any attacks of renal colic. It is probable that she has calculi in both kidneys, and surely in the right ureter.

Case IX.—Nurse. Seen first February 1, 1913; thirty-seven years old. Had been in good health until the beginning of the present trouble which started in 1907. At that time she was taken with severe pain in the left renal region and inability to void urine. Had temperature and was sick for two weeks. In 1908 she had a similar attack, but this time the pain was in the right renal region. After this the attacks came on, at first, every six months, then every three, and later every six weeks, alternating from one side to the other. In these she had vomiting; the pain was much relieved after vomiting; there was also dysuria, but never suppression as in the first attack. In 1910 she was taken very ill; pain, temperature, and bloody and pussy urine. Since then all the attacks have been on the right side. Began to lose weight in 1910, and for the past four or five months has been losing strength.

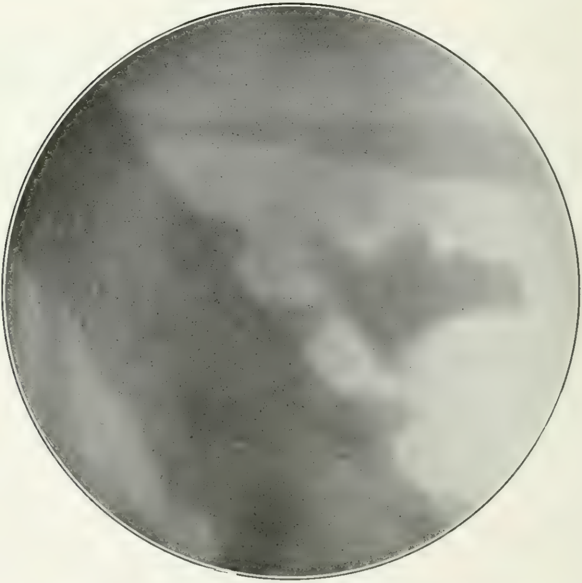

Fig. 6.—Case VIII. Large stone forming cast of right renal pelvis.

Examination shows a small, thin, anemic woman. Catheterized bladder urine shows a large amount of pus and some blood. Cystoscopy shows general catarrhal cystitis. Over the base of the bladder, in the bifurcation of the small blood-vessels, are seen small red, round, slightly elevated spots; these are not tubercles. I have seen these in only one other case, and that one of renal calculi. Catheterization of the right ureter done. No drainage from it; a large amount of pus is seen coming down the ureter alongside of it. Urine from the left side shows a moderate amount of pus, and some red blood cells. 0.6 phenolsulphonephthalein injected intravenously did not appear in the bladder until nineteen minutes had passed.

FIG. 7.—Case IX. Large stone forming cast of left renal pelvis.

Radiographs.—In each kidney, and forming a cast of the pelvis, is seen a shadow of a large branched calculus (Figs. 6 and 7).

On February 14, 1913, under gas oxygen anesthesia, the right kidney was exposed through an oblique incision, brought into the wound and the large calculus removed through the pelvis posteriorly. The pelvis was almost 1/4 inch in thickness. Catgut closure of the fascia and muscles; silkworm-gut closure of skin. A cigarette drain down to the pelvis. It was my intention to have this drain remain for sixty hours, but in the dressing it was by mistake taken out. There was urinary drainage for seventy-two hours, then cessation. On the tenth day there was some escape of pus and a small amount of urine from the middle of the wound. This persisted for two days, and after that the wound was dry. The patient made a stormy convalescence; there was much nausea and vomiting for six days, and extreme weakness. However, the patient pulled around and was able to go home on the thirty-eighth day after operation. The stone in the left kidney will be left until the patient has regained enough strength to warrant its removal.

Much damage to the kidney function had been done by the long presence of these calculi. and this was well indicated by the marked delay in the beginning of the elimination of the phenolsulphonephthalein. Except for urgent indications, I would not operate on cases showing such a slow elimination. Had I used ether, or had I attempted to do both sides at once, I feel sure that I would have lost my patient.

September 7, 1913. On account of the illness and death of her mother this summer, the patient has put off operation on the other kidney. She has improved much since the operation and has been free from the attacks of pain that she experienced on the left side.

Case X.—Seen first in July, 1913; thirty years old. She was an Italian from whom we were able to obtain very little history. For three months she had been suffering with pain in the left renal region and had been having chills and temperature. For this length of time the urine had been turbid from the presence of pus. Examination showed a thin anemic, much run-down woman, who had a tumor mass in the region of the left kidney the size of a grape fruit.

Cystoscopy showed a mild general cystitis. Both ureters were catheterized and clear urine obtained from the right, while urine containing a large amount of pus was gotten from the left. Ten cubic centimeters of a 0.3 per cent. indigo-carmine solution was injected intravenously. Strong elimination began on the right in three and a half minutes, while on the left there was none in half an hour. Radiographs showed a stone in the pelvis of the kidney.

In July, through an oblique lumbar incision I cut down on the left kidney, which was densely adherent, and with difficulty removed it. A large vein in the pedicle was torn, and there was profuse hemorrhage, which was not controlled until the patient was practically moribund. She died within a few minutes after being put in bed.

On section the kidney was found to consist of hypernephromatous tumors scattered all over it, extending from the cortex inward. These were found to be filled with miliary abscesses. In the pelvis of the kidney was found an oblong stone half an inch by one quarter.

The hypernephroma and the stone are probably only coincident. The destruction of the renal function was due more to the pyelonephritis than the tumor.

Case XI.—From the service of Drs. Quintard and Chace of the Post-Graduate Hospital. Seen first January 16, 1913. Has had four children. During her second pregnancy in 1910, she had much pain in the left renal region. While she noticed no blood, the laboratory report showed its presence and that of a small amount of pus. This pain kept up during the pregnancy and shortly after the delivery she passed two stones from the bladder. After this she felt better until the beginning of 1913, since which time she had had constant pain in the left renal region, pyuria, and hematuria, and has lost much weight and strength. Since the middle of December, 1912, has been having chills and running a high temperature. Von Pirquet positive.

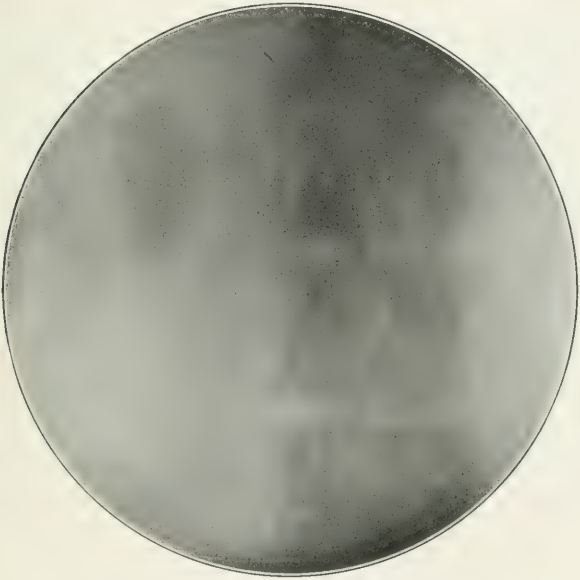

Fig. 8.—Case XI. Large stone in pelvis of left kidney.

January 21, 1913. Patient thin, weak, and shows the effects of septic condition. Bladder holds without discomfort 200 c.c. boric acid solution. General catarrhal cystitis. No urine seen coming from the left kidney. Indigo-carmine injected intramuscularly appears on the right side weakly in nine minutes and strongly in twelve. None eliminated from the left.

January 20, phenolsulphonephthalein in two hours 82 per cent.

February 12, 1913. While in the hospital temperature ranged from 99.5 to 101°. Radiographs show the shadow of a calculus the size of a pigeon's egg in the pelvis of the left kidney (Fig. 8). The patient went to the country to gain strength before operation and was lost sight of. In this instance the calculus had caused infection and destruction of the kidney and a nephrectomy would have been indicated.

Case XII.—Referred by Dr. James T. Padgett, of New York. Seen first September 25, 1911. Aged fifty-seven. Four children; youngest nineteen. Menopause at fifty-one.

In July, 1902, patient had severe pain in the right lumbar region which radiated down the back of leg, and to the bladder. There was almost incessant urination. The attack lasted two days, the spasms of pain being of seven hours duration with intermissions of three. She passed quantities of gravel that looked like granulated sugar. She had pain along this ureter from then until 1905. In 1905 she had a similar attack, lasting five days, and which terminated by the passage of a small calculus; this attack was on the left side. In 1907, after pain in both kidney regions for two months, she passed a small calculus after six hours of severe pain.

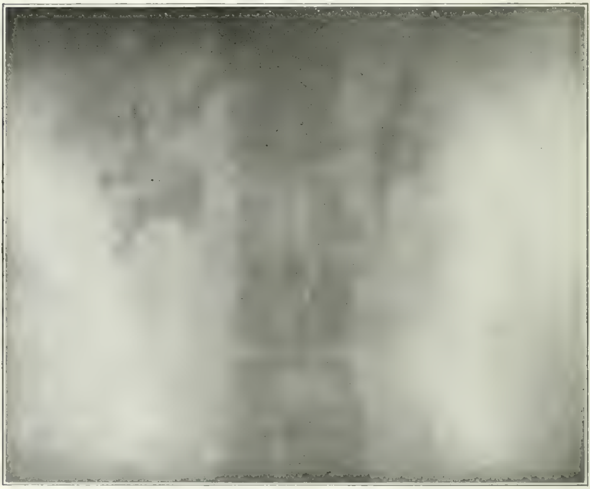

Fig. 9.—Case XII.

In March, 1911, she had blood in the urine for a short time. Was then radiographed, but no evidence of stone was found.

In March, 1911, she began to have pain over the lower dorsal region, which after a time appeared over the sternum and later over the breasts. These attacks would last from ten to twelve hours, and at first were three weeks apart. Recently the interval has been a week.

On September 26, Dr. Leopold Jaches radiographed her with negative results. I then injected both renal pelves with 50 per cent. argyrol and obtained good radiographs showing normal pelves and ureters (Fig. 9). The elimination of indigo-carmine occurred from both kidneys within seven minutes after intramuscular injection. The urine was negative.

She was free from pain until October 22, 1911, when she had a mild attack. On December 21, 1911, after suffering from Thanksgiving, she passed a small calculus from the left side. She was comfortable until July 4, 1912, when she had pain in the left renal region and after five hours passed about 20 grains of gravel. There was soreness in the left renal region at the time of the report, June 25, 1912.

September, 1913. Since June, 1912, the patient has at times had attacks of pain in the left renal region and has passed two calculi.

The history of the passage of calculi, both before and after radiographs, and the normal pelves, as shown by the pyelographs, lead to two conclusions: that the *x*-ray failed to show stones that were present, or that the kidneys and ureters were free of stones at the time of making the pictures, and that they subsequently formed.

CASE XIII.—Seen first September 3, 1913. Four children, youngest five months old. Has had marked lateral spinal curvature since she was seven years old. When the last baby was three days old she began to have severe pain in the left renal region, with severe headache. This persisted for ten days. Since the middle of this past July she has had pain in the left renal region, which has radiated down the ureter. She came to my clinic the last part of August when I was away, and then it was seen that the left ureter was pouting and markedly edematous. At this time ureteral catheterization was impossible, as the catheter met an obstruction a short distance up the ureter and buckled back. Radiographs then made showed shadows in the pelvis and in the renal region. When I saw her, which was shortly after a particularly severe attack of colic, when she passed several small stones, the ureter was still edematous, but not so much as when she first came to the clinic. Since then the pain has been better and the ureteral orifice on September 13 appeared only slightly reddened. Radiographs made on September 11, show shadows in the ureter just above the sacroiliac joint and several shadows in the kidney. All of these are small, and it is probable that they will pass with little difficulty. If they do not, I shall through a ureteral catheter inject the ureter with glycerin or olive oil, and in this way encourage their expulsion.

CASE XIV.—Seen first on June 1, 1910.

Aged twenty-six; mother of two children, the youngest stillborn, April, 1909. Felt well until November, 1908, when at the fourth month of her last pregnancy she had severe pains in the left lumbar and left inguinal regions, lasting eighteen hours. There was some temperature the following week. Three weeks after the birth of the last child she passed a small oval calculus and another three weeks after this, the only pain being in the urethra as the stone was being expelled from the bladder.

Since April, 1909, she has had some pain in both inguinal and in left lumbar regions.

Since the first of April, 1910, she has noticed some blood in the urine, and it is for that reason that she came to consult me.

Cystoscopic examination of the bladder is negative. The right ureteral catheter is obstructed at 9 inches, and the left at 3 inches.

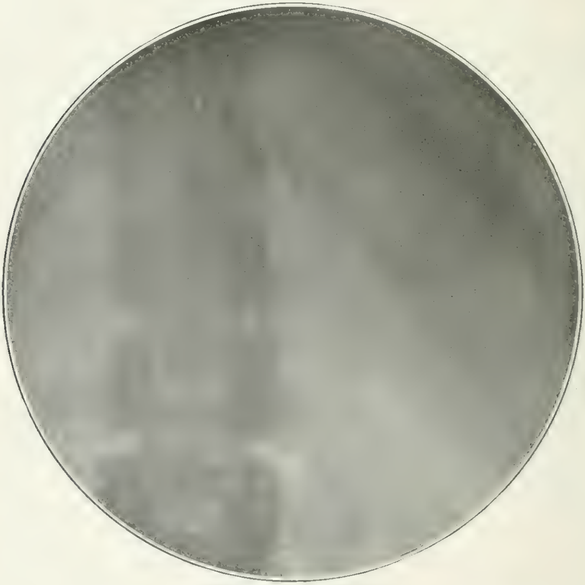

FIG. 10.—Case XIV.

Clear urine from the right, and urine containing a moderate amount of blood from the left.

Radiographs show two stones in the calices of the left kidney, stone in the left ureter opposite the transverse process of the third lumbar vertebra, two stones in contact in the pelvic portion of the left ureter; and a stone opposite the transverse process of the third lumbar vertebra in the right ureter (Figs. 10, 11, 12, 13).

While this patient had had one attack of renal colic and had passed two stones, her chief complaint was the hematuria, which, in all probability, was due to the renal calculi in the left kidney. She became pregnant shortly after the examination and was lost sight of. The multiplicity of the stones is a noteworthy feature in this case.

CASE XV.—Referred by Dr. P. S. Boynton, of New York. Seen first February 6, 1913. Aged fifty-seven years.

In 1898 passed four stones per urethra which, from the history, evidently had their origin in the left kidney.

On January 8, 1913, while reading was seized with sudden pain in the left renal region, radiating downward along the ureter, which required a hypodermic injection of morphine for relief. That same afternoon there was another attack. On January 11, another more severe attack, associated with chills and rise of temperature, necessitated patient being in hospital five days. Since then the temperature has ranged from 100 to 101°. Another such attack on January 29. Radiographs show shadows of two stones in the lower pole of the right kidney and one in the lower end of the right ureter. In passing a catheter into the right ureter an obstruction was met at 1 1/2 inches and another at 4, the upper one being the more difficult to pass. Oil was injected above the stone at this time, and on February 8 glycerin, but neither dislodged the calculus.

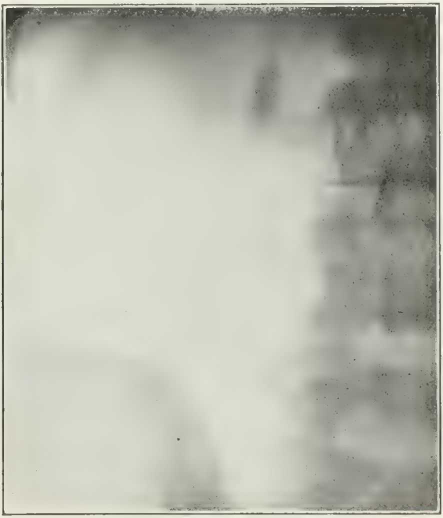

FIG. 11.—Case XIV. Stone in left ureter, opposite transverse process, third lumbar vertebra.

On February 11, Dr. Boynton removed the stone transperitoneally after milking it to a point opposite the promontory of the sacrum. This stone was the size of a pea, and shaped like an arrow-head. Patient died forty-eight hours after operation from pneumonia.

Remarks.—The long freedom from the trouble after the passage of stones in 1898, the sudden occurrence of trouble anew with two calculi in the kidney and one in the ureter, are the noteworthy features of this case. The renal calculi were not operated upon as they were not causing symptoms, and the condition of the patient was bad.

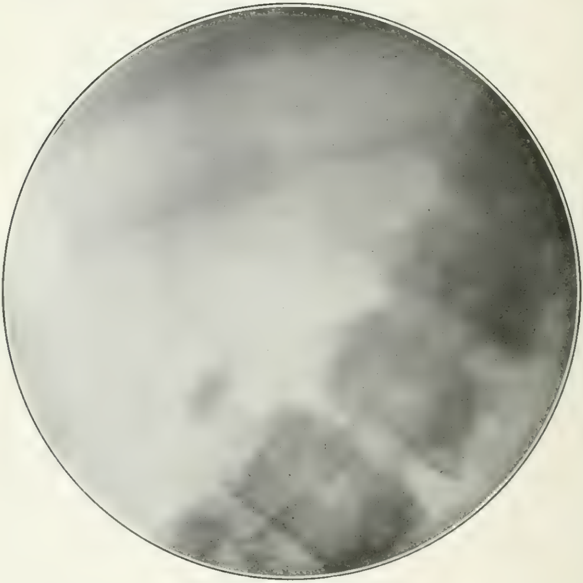

FIG. 12.—Case XIV.

CASE XVI.—Referred by Dr. Scaturo, of New York. Aged twenty, when seen November 10, 1912. Married in January, 1912, and had a child in October of the same year. From the time she was five months pregnant she had pain over the appendix region, and had chills and fever which led to the diagnosis of typhoid fever. The urine contained much pus.

The patient is anemic and shows the result of her sickness. The catheterized bladder urine contains much pus. Cystoscopy of the bladder negative. Clear urine from the left kidney. The right ureteral catheter was obstructed at 5 inches; purulent urine from the right. Radiographs of the urinary tract showed a shadow at the point of obstruction on the right. The patient felt better after the examination, which was probably due to the fact that I loosened up an impacted stone.

On December 8, I removed the stone transperitoneally. The ureter above the stone was dilated to the size of the adult forefinger and was much thickened. The incision was made through the peritoneum, which was adherent to the underlying ureter, and the stone removed. An ounce of urine escaped and shot up into the air about an inch and a half, although the pelvis of the patient was elevated. The wound in the ureter was closed with fine catgut and the peritoneum sutured over it. The stone was T-shaped, and 1/4 inch long, with the transverse part of the T something over 1/8 inch broad. Patient made an uninterrupted recovery and, at the present time, September, 1913, is well and free from symptoms.

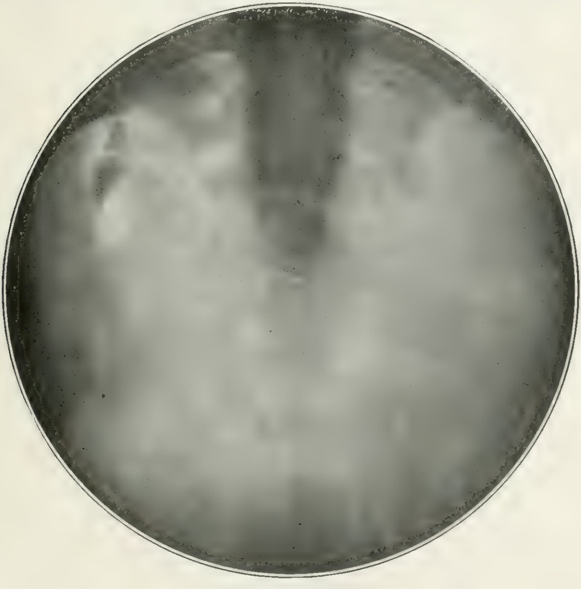

FIG. 13.—Case XIV.

CASE XVII.—Seen first May 13, 1910. Forty-nine years old. Menopause at forty-two. Her first labor was in 1888, and was instrumental. For six months she was very sick with puerperal fever and phlebitis of both legs, and not well for fifteen months. From

1888 to 1891 she suffered with frequent attacks of pain in the right renal region, and high temperature. The last one terminated in the passage into the bladder of a large amount of pus.

There was no trouble until 1907, when she began to have similar attacks in the left side, lasting four to five days. In the past year she has had several. Has had moderate pyuria since 1900.

Catheters easily passed into both ureters. That from the left kidney drains purulent urine; that from the right clear.

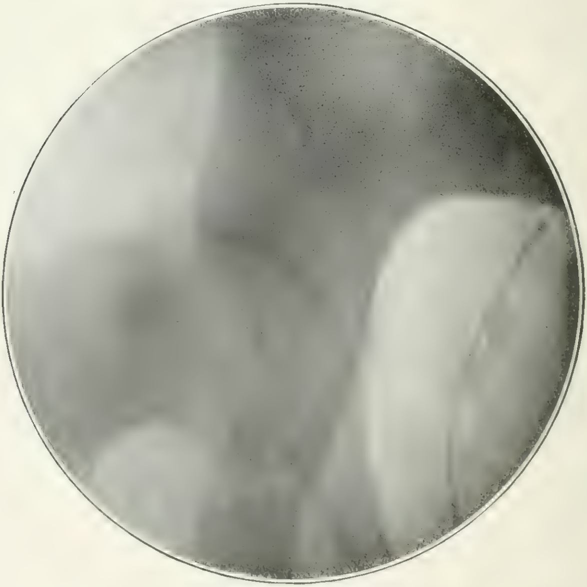

FIG. 14.—Case XVII. Two stones in left ureter. The tip of the bougie is 4 inches from the vesical orifice of the ureter.

Radiographs showed two shadows in the pelvis that were diagnosed as ureteral calculi after a confirmatory plate with an x-ray catheter (Fig. 12).

On January 16, 1911, in Quebec, by the combined intra- and extraperitoneal operation, with an incision along the outer border of the rectus, I removed two small stones from the ureter, which were situated 2 inches from the vesical orifice. Cigarette drain for forty-eight hours, after which time there was no leakage. The ureter was not sutured.

This patient was seen April 12, 1912, and reported that she was well and had had no further trouble.

The stones were only 1/8 inch in diameter, a size that would ordinarily easily pass through the ureter. These were very adherent to the ureter, yet the ureteral catheter was passed with no sensation of obstruction.

CASE XVIII.—Seen first in November, 1909. Fifty-six years old, nine children, last born in 1899. Was in good health until 1904, when she began to have attacks that presented the following symptoms: Lassitude for a few hours, lameness in the right leg, soon followed by slowly developing pain in the right lumbar region, which soon radiated to the front and down the ureter to the bladder. When the pain was at its worst there was vomiting. An attack lasted, as a rule, about twelve hours. During an attack there was frequent desire to urinate; the urine then passed was clear, while that following was turbid and had a heavy sediment. She has had these every two or three months, the last one being in August, 1909.

FIG. 15.—Case XVIII. Two large and one small stones in right ureter, the lowest being three and a half inches from the vesical orifice of the ureter, as measured by a ureteral catheter.

Cystoscopy negative. Ureteral catheter easily passed on the left; the urine from this kidney was clear. On the right the catheter was obstructed at 3 1/2 inches, and through it no urine was obtained.

Indigo-carmine injected intramuscularly was eliminated in nine minutes from the left kidney, while none was observed from the right.

Radiographs showed two large stones in the pelvic portion of the right ureter (Fig. 13).

On January 13, 1913, through an incision along the outer border of the right rectus, I removed these two stones extraperitoneally. Each stone is 3/4 inch long by 1/4 broad. The wound in the ureter was closed with fine catgut, and the abdominal wound drained for twenty-four hours. There was no leakage, and healing was prompt.

For six years this patient suffered from attacks due to these stones, and in this time the renal function was destroyed. Early diagnosis and treatment would have saved her a good kidney.

CASE XIX.—Referred by Dr. Edward Quintard, of New York City. Seen first in June, 1910, when she was fifty-seven years old. Has had three children, the oldest born in 1877, and the youngest in 1897. Labors normal. Menopause uneventful at the age of forty-eight.

Previous history negative. In June, 1909, the patient for the first time had colicky pain in the left renal region, which did not radiate, and lasted twelve hours. There was nausea and vomiting during the attack. At this time there was no frequency of urination, but a month later she began to be so troubled, and this has persisted until the present. Since the first attack there have been three others, but none so severe as the first. The urine is normal except for the presence of a few pus and red blood cells.

By vaginal examination, just to the left and behind the cervix, is felt a small hard, oblong mass. The bladder appears normal. On the left side the ureteral catheter meets an obstruction at 3 to 4 inches which can be passed. A waxed catheter was then passed and all the wax scraped off. Radiographs show a shadow at the point the ureteral catheter was obstructed.

Attempts were made to have the stone pass by dilating the ureter to 20 French, but were not successful. There was marked inflammatory reaction in the ureter after this instrumentation, and this explains the failure. She refused operation, and was lost sight of.,

In this case the pain was renal and the only thing to indicate a low position of the stone was the frequent urination. Although the stone was in the terminal portion of the ureter, the appearance of the ureteric orifice was perfectly normal.

CASE XX.—Referred by Dr. E. W. Peterson. Seen first July 10, 1912. Forty-nine years old. In 1901 patient had a three-day attack of pain in the right lumbar region, followed by the passage of a stone and hematuria. She was free from pain and any bladder disturbance until April, 1912, when she had pain for an hour in the right lumbar region. Since then she has had almost constant macroscopical hematuria, and urgent and frequent urination.

The catheterized bladder urine is turbid and reddish from the admixture of blood and pus. Cystoscopy shows what appeared to be a broad base papilloma over the region of the right ureter, with surrounding edema. This could also be felt through the vagina.

Thinking it a papilloma, I fulgurated it on July 14, and again on July 18. At an examination on the 21st, I was surprised to see a dark stone projecting through the tumor-like mass. An attempt was made to liberate this through a Kelly tube with the aid of a small curet. This was unsuccessful as the patient was very fat, and would not retain a proper posture and repose. On July 25, another examination showed the stone almost born. It appeared to be of the size of a hazelnut. I planned to have her come to the hospital with the idea of (under ether) introducing a large Kelly cystoscope and seizing the stone with a wire snare and thus removing it, and if it were too large, to crush it with a lithotrite and wash out the fragments.

We had had radiographs made, which were unsatisfactory, so this accounted for the error in diagnosis.

After this I did not see the patient until January, 1913, when upon examination I found two stones the size of hazelnuts in the bladder. The ureteral opening on the right was the size of a lead pencil and was not inflamed or edematous. She had had much pain for three months in the right side, so I suspect the presence of other calculi in the right kidney or ureter.

This was a very instructive case and shows that all cases of supposed papilloma, where the growth is situated over a ureteric orifice, and there is edema, should be radiographed for stone. Fulguration is a slow, but bloodless, and only slightly painful method of liberating these impacted calculi in the lower end of the ureter.

CASE XXI.—Seen first in January, 1913. The history of this case is rather indefinite as I have been unable to ascertain all the facts. Three months before I saw her, she had had her right kidney explored, and it was said that then she had an infected hydronephrosis due to ureteral obstruction. From time to time, previous to operation, she had been having marked pain in that kidney and running a temperature. Until the drainage wound healed she did well, but upon its closure she began anew to have her old symptoms. A month and a half before I saw her she was operated upon for the same condition by another surgeon, who obtained the same results. The three weeks before my visit she had been running a high temperature and having a great deal of pain in the right side.

The left ureter was easily catheterized. On the right side the catheter met an obstruction at 1 inch. This obstruction was movable, and at the end of my examination I was able to get the catheter in without resistance 2 1/2 inches, but no further. By the vagina I felt a hard mass in the ureter region, about the size of a pea, that I felt sure was a stone. I suggested radiographs, and the shadow of a stone was found.

The surgeon who did the second operation removed this stone extraperitoneally, and the patient made a good recovery and has been relieved.

With our present-day methods of diagnosis, I think it inexcusable for a surgeon to explore a kidney without making use of them. This case is one in point.

There were twelve cases of renal, six of ureteral, and three of combined ureteral and renal cases.

Hematuria.—In one (Case I) a brisk hematuria of eight days' duration was the only symptom. In Case VI the blood came from a kidney that was causing no other symptoms, the pain on the other side being due to a hydronephrosis, and in Case XIV hematuria was the principal symptom, though she had had pain upon passing calculi. Case IX had hematuria and pyuria on both sides, yet on one there had been no pain for three years, even though the pelvis was filled with a large stone.

Pyuria.—In Case V it was the only symptom and had been present for years, while in Case VIII pyuria had existed for some time with only slight renal pain. In Case VII the pyuria was evidently of long duration, and yet with the large calculi she had had only one brief attack of pain. In five others (Cases II, III, X, XI, XV) there was pyuria, but this was accompanied by other symptoms.

Pain.—In five (Cases II, IX, X, XI, XII) the pain was severe, while in four (Cases III, IV, VII, VIII) there was only slight discomfort. In three (Cases I, V, VI) it was of no consequence. In Case IX there were calculi in both kidneys, yet for three years there had been no pain in one. In the mixed cases of renal and ureteral calculi (Cases XIII, XIV, XV) I think the pain due entirely to the ureteral stones.

Damage to the Kidney.—In three (Cases VI, VII, IX) there was marked damage to the renal function from pyelonephritis, and in three (Cases V, X, XI) the function was practically destroyed.

Multiplicity of Stones.—In six (Cases V, VI, VII, XIII, XIV, XV) more than one stone was found. In three (Cases VIII, IX, XII) there were stones in both kidneys. In Case XIV there were stones in the left and its ureter and in the right ureter. In three (Cases XIII, XIV, XV) there were stones in the kidney and its ureter.

History of the passage of one or more calculi was obtained in five (Cases IV, X, XIII, XIV, XV).

Symptoms arising during pregnancy were observed in three (Cases XI, XIV, XVI). One of these (No. XVI) falls under ureteral calculi, but is here included.

All the patients, except one (Case VIII) were radiographed, and in this one the diagnosis was made with the waxed catheter. Only once did the radiographs fail to show the presence of stone (Case XII).

In the renal cases cystoscopy alone showed nothing that was diagnostic of stone; no changes were observed in the appearance of the ureteric orifices.

Pyelotomy was done in four (Cases I, III, VI, IX). In two (Cases I, III) the pelvis was sutured, while in the other two (Cases VI, IX) it was not.

In one pyelotomy and nephrotomy, without suture of the renal pelvis, was done.

Case XI should have a nephrectomy as the calculous kidney is functionless. Case I had best not be operated but be kept under observation. In Case XIII the stones are small and will probably be passed spontaneously. In Case XII the radiographs failed to show stones, and it would be difficult to find such small stones as she passes; she had better not be operated. Three (Cases IV, VIII, XIV) refused operation.

Deaths.—Case VI died from renal insufficiency, Case XV from postoperative pneumonia, and Case X from hemorrhage from a vein of the kidney pedicle, which was torn at operation and so retracted that the patient was moribund before the bleeding was controlled.

Case VII from whom several stones from an infected kidney were removed, will probably have to have a nephrectomy. Case IX is to return to have the stone removed from the other kidney.

Combined Renal and Ureteral.—Case XIV showed two calculi in the left kidney and three in its ureter, with another in the ureter of the right side. In this patient the principal complaint was hematuria that was, in all probability, from the kidney with the stones. In Case XIII there was to be seen a number of small calculi in the kidney and its ureter of the left side, but these are small and will probably be passed. During the passage of some of these marked edema of the ureter was seen cystoscopically. Case XV had marked chills and temperature due to an obstructing ureteral calculus; attempts to make this pass by the insertion of a ureteral catheter and the injection of glycerin and oil were unsuccessful.

Ureteral Cases.—In all six (Cases XVI, XVII, XVIII, XIX, XX, XXI) the pain was a prominent feature and in all it was renal. In three the pain came on periodically (Cases XVII, XVIII, XXI), while in three (Cases XVI, XIX, XX) it was constant, and in addition to being felt in the renal region, there was pain at the seat of the stone. In the attacks in all the cases there were chills and temperature.

Case XX was the only one that showed any evidence in the ureter of the presence of stone. In Case XIII (a combined ureteral and renal case) there was edema of the ureteric orifice. Case XIX had the stone in the intravesical portion of the ureter, yet there was no change in the ureteric orifice.

In Cases XIX, XX, XXI, the stone could be felt through the vagina.

In four (Cases XIII, XVI, XVIII, XXI) the catheter could not be passed beyond the stones, in two (Cases XV, XIX) with difficulty, in one (Case XVII) there was no sensation of obstruction. In Case XX there was so much edema that the ureter could not be found.

There was some pus in all.

In two (Cases XVIII, XX) there was complete destruction of the kidney function; in Case XVI impairment and a hydroureter and a hydronephrosis.

In two (Cases XVIII, XXI) the stones were removed extraperitoneally; in Case XVII by the combined intra- and extraperitoneal method, and in Case XVI by the transperitoneal route. Case XV, a combined case of renal and ureteral calculi, had the ureteral calculus removed transperitoneally. In three (Cases XV, XVI, XVIII) the ureter was sutured and there was no leakage. In two (Cases XVII, XXI) it was drained. Recoveries in all except Case XV, who died of pneumonia.

In three attempts were made to dislodge the stones with the ureteral catheter, the injection of oil and glycerin, and the ingestion of large amounts of water, but without success.

CONCLUSIONS.

Renal and ureteral calculi are frequent Two or more stones in a kidney, or kidney and ureter of the same side, and stones in both kidneys and ureters are not infrequent. Ureteral calculi are, I believe, almost always renal in origin.

On symptoms alone, the diagnosis is often only problematical, for typical stone symptoms are encountered in other conditions, and stone cases are numerous with few, if any, symptoms. The attacks encountered in Dietl's crises of floating kidney, in stricture of the ureter, and in tuberculous kidneys and ureters, are symptomatically like those of calculous colic.

The diagnosis is best made radiographically, and in suspected cases the *x*-ray examination should follow the taking of the history and the urinalysis, and precede all other methods of diagnosis. In only a small percentage is there failure to find stones that are present. In doubtful shadows, an *x*-ray catheter should be inserted into the ureter, or the ureter injected with argyrol, and other radiographs made, best stereoscopically. An advantage of the argyrol method is that should a stone have been present for any length of time there will almost surely be a dilatation of the ureter above it, and this will be shown. To corroborate the radiographic diagnosis, which is seldom necessary, and to be used when a good *x*-ray apparatus is not to be had, is the waxed catheter.

Where shadows of stones are found and there is pain on the other side, we should be wary in calling it reflex. A most careful search should be made for some condition that is causing the pain. A good illustration of this is my case where on the side with two large stones there was no pain, and on the other a ten-ounce hydronephrosis that was causing all the symptoms.

The amount of damage done to the kidney from the presence of stones, depends upon the size, location and whether or not there is infection. The stones that cause the most destruction are those that cause blockage of the ureter, either in the pelvis or in the ureter. Aseptic stones in the calices, unless of large size, do little damage, though they are prone to cause hematuria.

The extent of the damage to the kidney can be, and should be, ascertained before operation, as its condition will largely determine the procedure to be carried out. For the combined functional capacity of the two kidneys, I use the phenolsulphonephthalein test. If the two show a good output, I infer that at least one kidney is doing good work. The relative capacity is then found by observing through a cystoscope the elimination from the ureters of indigo-carmine that has been injected intravenously (10 c.c. of a three-tenths of a 1 per cent. solution). This eliminates the error of ureteral leakage, and does not necessitate prolonged ureteral catheterization.

In simple renal calculi, I think pyelotomy, or a combination of pyelotomy and nephrotomy, is the most satisfactory operation. Nephrotomy alone is best reserved for the cases where one of the other two is not suitable. In pyelotomy I do not think it either necessary or desirable to suture the renal pelvis, unless the case is an aseptic one, as the wounds close promptly and there is no danger of a fistula unless there is ureteral blockage lower down. If there are multiple stones and marked infection, and the other kidney is free of stones and in good condition, then I think nephrectomy the operation of choice.

When renal and ureteral calculi are both present, and the condition of the patient does not warrant operations for both, I believe that the ureteral stones should be the first to be removed, as they are the ones that are likely causing the obstruction and symptoms.

Many ureteral calculi are passed naturally, and when a patient is seen with symptoms of recent date and they are not urgent, it is best to wait a reasonable time for the stones to be expelled. Should the stone become arrested, or it be a case in which the stone has made no progress in a long time, attempts to dislodge it with a ureteral catheter and injections of oil or glycerin, should be made. If these are unsuccessful, the operation can be undertaken. For those that cannot be attacked from the vagina or bladder, the best procedure in stones that will be difficult to locate is the combined intra- and extraperitoneal operation. If they can be easily found on account of their size, I would prefer the extraperitoneal route. It is not necessary to close the ureter, as it heals rapidly. A cigarette drain near the ureter had best be used for seventy-two hours, or while there is still drainage. If the stones are to be felt through the vagina, they can be removed through it; if impacted in the vesical orifice, by slitting the ureter through an operating cystoscope, or after suprapubic cystotomy, or by cautery fulguration as in one of my cases.

375 West End Avenue.

EXOPHTHALMIC GOITER AND PREGNANCY.[1]

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Although this subject has in part been presented by Dr. G. G. Ward at the last meeting of our Society, I venture to reopen the question in order to elicit from the members an expression of opinion as to the best way of dealing with a pregnancy complicated by exophthalmic goiter. That such cases are somewhat out of the ordinary is probably due to the restraining influence which Graves' disease exerts upon conception. The individual observer thus deprived of sufficient personal experience must look to the accumulated experiences of other individual observers for guidance. As yet, the opinions have not become crystallized, and the views of those, who backed by the authority of Charcot and Kocher, ascribe to pregnancy a salutary influence upon exophthalmic goiter, are almost diametrically opposed to the beliefs of others, who see in the coincidence of these two conditions a grave danger to the life of the patient. In consequence, the therapeutic régime suggested ranges between a merely expectant attitude and a radical operative intervention.

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[1] Read (by title) before the American Gynecological Society, Washington, D. C., May, 1913.

In the case to be described presently there was, however, but little doubt left as to the safest course to pursue.

Case I.—Mrs. W. W., aged thirty-four years, was referred to me by Dr. Walter Fischel on Sept. 2, 1910, for the repair of a complete tear of the perineum suffered at the first of her three confinements five years previously. For the last six months she has become very nervous, which she ascribed to the discomfort of incontinence of the bowels, while Dr. Fischel found in her a beginning exophthalmic goiter. Her history up to this time was unimportant. To her knowledge there has never been a case of goiter, diabetes, or psychosis in her family. Her own menstrual history was normal in every respect, nor had she noticed a swelling of the neck or a protrusion of the eyeballs. The repair of the laceration was to be performed under spinal anesthesia as an inhalation narcosis seemed to add an element of danger, but the stovain solution used was too weak and my own technic imperfect, as this was my first case of spinal anesthesia; so that the analgesia was incomplete and a small quantity of ether had to be given which was, however, well tolerated. Her recovery and the result of the operation were eminently satisfactory.

Within the next six months, however, the symptoms of Graves' disease became somewhat more pronounced although she remained under medicinal treatment. The goiter extended from the left to the right side; the tremor increased; the heart action became accelerated; there were frequent attacks of diarrhea, and she had amenorrhea from January to May, 1911.

She again consulted me at the end of November, 1912, when I found her to be pregnant about twenty weeks. While she herself claimed that her goiter was not materially larger than previously, yet her entire condition was undeniably worse. The exophthalmos was greatly pronounced, both tremor and general weakness were markedly increased, the heart tumultuous, the pulse very hard (blood-pressure tests were made but unfortunately not recorded); hands, feet and face were swollen. Loss in weight was not inconsiderable. The urine contained a large amount of sugar and had a specific gravity of 1037. Polydipsia and polyuria were marked.

In view of the change for the worse in the general condition of the patient and further considering the complication of glycosuria, it seemed best to relieve an organism already laboring under great disadvantages from the added strain of pregnancy and labor, and interruption of pregnancy was decided upon in consultation with Dr. Fischel. A few days in bed but without any particular antidiabetic diet reduced the specific gravity of the urine and brought about the disappearance of sugar without, however, affecting the thirst and polyuria or influencing the symptoms of exophthalmic goiter. The operation was performed December 10, 1912, under spinal anesthesia with 2 c.c. of a 10 per cent. novocain solution with suprarenin, which produced complete analgesia. A typical vaginal Cesarean section was done, a fetus of about twenty-two weeks was turned and extracted, and the incision sewed up in the usual way. The bleeding was very slight, and there was absolutely no shock or pain.

The beneficial effect of the operation was startling. The swelling disappeared almost immediately; the patient while in bed looked practically normal, the exophthalmos receded, the neck became smaller, and the heart's action calmer. Polydipsia and polyuria subsided within two or three days and patient left the hospital in excellent condition twelve days after the operation.

Since then she has remained under medicinal treatment and is slowly gaining in health. Goiter and exophthalmos have not increased but the pulse rate has again gone up, and the menstruation has at the present writing, *i.e.*, four months after the operation, not yet reappeared.

In order to determine our attitude in cases such as the one described, we must needs appreciate to its fullest extent the influence which exophthalmic goiter exerts upon the entire organism. Whatever theory of the etiology of this affliction we may accept, whether we consider the true nature of the disease to be a hyperthyroidism or a hypothyroidism, this fact is indisputable that such patients suffer and die from heart disease (Moebius). It is mainly the condition of the heart which decides the possibility of a cure. Notwithstanding our total ignorance of the real character of the toxic agent, we know from thousandfold experience that the vitality of patients with Graves' disease is markedly diminished and that the extent of their general resistance against any increased demands cannot be foretold. It is this question above all others that calls for earnest consideration when an exophthalmic goiter becomes complicated by pregnancy. Now that the problem of exophthalmic goiter has received so much attention within the most recent past, we gynecologists will be in a position of acquiring valuable experience. It is well known that the disease attacks the female sex more frequently than the male. Buschau found among 980 cases 175 men and 805 women. Mannheim determined the proportion of men to women as 1:8.2, and other authors report even higher percentages. Whether or not there is a causal relationship between exophthalmic goiter and gynecologic diseases, as first claimed by H. W. Freund, I dare not decide. It so happens that practically all patients with Graves' disease whom I have observed in the last ten years had normal genital organs or else they presented conditions such as perineal lacerations or carcinoma, which certainly had no etiologic connection with the affection of the thyroid. I am as yet more inclined to believe in a coincidence of two so frequent groups of disease. It is perhaps permissible to mention in this connection that when speaking of exophthalmic goiter we must not merely have in mind the well pronounced cases with the triad of exophthalmos, goiter, and tachycardia. W. W. Graves, of St. Louis, has only recently, and to my mind very justly, pointed out that ever so many cases which are being treated for nervousness, hysteria, gastrointestinal neuroses, functional heart disturbance, or some trivial affection in the genital sphere or other parts of the body, are in reality earliest forms of hyperthyroidism.

When seeking information regarding the problem of exophthalmic goiter and pregnancy I found practically all of the literature up to 1912 carefully considered in the comprehensive studies by Novak and Ward, both of which authors have been freely consulted for this article. While these writers admit that the disease of the thyroid may occasionally be influenced favorably by an intercurrent pregnancy, yet they insist that this is the exception rather than the rule.

In the following case, an influence of an exophthalmic goiter upon a co-existing pregnancy was unmistakable.

CASE II.—Mrs. A. B., aged forty-two years, primipara was seen in consultation with Dr. L. P. Butler, Feb. 17, 1913. She was married eight years and had presented symptoms of well-advanced Graves' disease in 1909. A year later practically all objective and subjective signs of the disease had disappeared under medicinal treatment (Dr. Butler). She was pregnant since Aug., 1912, presenting none of her former symptoms save a slight exophthalmos. In the latter part of January she developed albuminuria and increase in blood pressure, both of which conditions progressively grew worse in spite of strictest measures. Our intention of interrupting pregnancy when the fetus became viable was anticipated by the morbid process which led to the premature birth of a macerated fetus April 1, 1913. I have been told by Dr. Butler that the symptoms of Graves' disease have again made noticeable progress since the confinement.

Quite recently, Bernard v. Beck has added a contribution to the subject based on an unusually large material. He contends that pregnancy causes an increased demand upon the thyroid. Until the latter has become accustomed to this increase, there exist disturbances in the function of the gland which cause subjective symptoms in the first two or four months of gestation. Patients with Graves' disease, whose thyroids have already been functionating excessively before conception occurred, improve subjectively during pregnancy. This, he claims, is chiefly due to the absence of the menstrual cycle which, in the nonpregnant state, is one of the main causes of an increase of disturbance. Only if during the earlier months of pregnancy the nervous symptoms rapidly and persistently increase should operative treatment in the form of strumectomy be instituted. The treatment in all other cases should consist of internal remedies. Subjective improvement usually occurs after the fifth month of pregnancy, and labor is uncomplicated. In 260 cases of Graves' disease and pregnancy he felt compelled to perform thyroidectomy only in five cases, and in no case did he find it necessary to interrupt pregnancy.

This is, indeed, a remarkable record and would relieve us of all doubts, if the conditions prevailing in Karlsruhe, where v. Beck works, could be applied to this country. v. Beck states that the German principality of Baden has a very large percentage of affections of the thyroid of all kinds (he himself has observed 1090 women with goiter within eleven years!), and I wonder whether so common an affection does not lose a great deal of its dangers. Conversely, the same disease is infrequent in this country—or at least not endemical—and consequently more severe, in analogy to other diseases that are transplanted upon a virgin soil. If this assumption is correct, it would explain the harmlessness of the complication in question in Kocher's statistics from Switzerland, another goiter country, and the opposed views of Cholmogoroff in Russia, Kleinwæchter in Poland, and others.

At any rate, in the case under consideration, the hoped-for improvement did not occur in the fifth month. On the contrary, the patient gave the impression of a very sick woman, and the clinical picture rather closely resembled that of an *acute* Basedow's disease which has been so graphically depicted by Schlesinger.

The increase in the size of the goiter was least pronounced, but the exophthalmos, the tachycardia, the gastrointestinal disturbances, the tremor, and above all the loss in weight, were distinctly aggravated. Another noteworthy feature was the appearance of sugar in the urine, which Schlesinger has also observed in a number of his cases. Glycosuria is of very common occurrence in the second half of pregnancy and as a rule only transitory. Occasionally such glycosuria develops into a true diabetes, and when as in our case there is a high specific gravity with polydipsia and polyuria we cannot pass lightly over this complication, notwithstanding the fact that in this case the sugar disappeared from the urine after a few days of rest in bed. I myself have become rather apprehensive since I have seen a case of diabetes appear under my eyes and lead to death in coma within three weeks.

After this article had been written, a paper by Seitz on the same subject appeared in print. Since this treatise represents at the present time the most exhaustive study of the relations between exophthalmic goiter and pregnancy, at least the most important points must here be inserted. Seitz has collected in all 112 cases from his own material, from literature and from circular letters. He has carefully tabulated, of all these cases, the menstrual history, the first appearance of evidences of hyperthyroidism, the symptoms in former and in the present pregnancies, the therapy employed, and the results as far as mother and child were concerned. He found that the manifestations of hyperthyroidism were not affected in about 40 per cent. of the cases; a very small number even improved during pregnancy. On the other hand, sixty-seven out of 112 cases (= about 60 per cent.) were made distinctly worse by gestation. In about one-fourth of these sixty-seven cases a serious danger to health and life of the patients ensued. Seven patients died; in five cases therapeutic abortion and in eleven premature labor were produced, while in seven cases thyroidectomy was performed during pregnancy.

In discussing the symptomatology, Seitz found in his statistics three cases of miscarriage, three macerated fetuses and three cases of premature birth. He ascribes the intrauterine death and maceration of the fetus to toxic influences, a factor which very likely played a rôle in my second case. He also refers to a report by Clifford White of a patient with Graves diseas who had given birth to two children with congenital exophthalmic goiter.

Seitz, like all other observers, considers the effect upon the heart as the greatest danger, and while he expresses himself very conservatively throughout, yet he warns against too great an optimism as to the seriousness of hyperthyroidism in pregnancy. He has not seen any decisive results from medicinal treatment nor does he consider *x*-ray treatment as yet of definite value. More stress is laid upon a dietetic-hygienic régime by which the greater part of the cases can be kept in fairly good condition. At any rate in the first part of pregnancy an expectant treatment is more advisable than artificial abortion. Only if in later months both subjective and objective symptoms progressively grow worse, does he admit of an indication to interfere with pregnancy.

While thus an acute exacerbation of all symptoms of an exophthalmic goiter must put us on guard and warn us against subjecting the lowered vitality of the patient to any continued strain such as the remainder of pregnancy would produce, the method of relieving this strain must be equally carefully considered. For even a slight operation, a short narcosis, or a mild infection may prove disastrous. Under these circumstances vaginal Cesarean section seemed to me, as it did to Ward, Hammerschlag, and Riessmann, the least dangerous form of intervention and preferable to the induction of labor by means of bags or the like.

The possibility of performing vaginal Cesarean section under *spinal anesthesia* marks, in my opinion, a distinct advantage. If the patient is brought to the operating table in "twilight sleep," spinal anesthesia represents the principles of anoci-association which Crile demands particularly for operations for exophthalmic goiter. As a matter of fact, there was both during and after the operation no shock whatsoever.

There is, of course, the question whether a thyroidectomy would not be preferable to interruption of pregnancy. The literature on this question is still too meager to permit of definite conclusions, but as the mortality from this operation steadily grows smaller, it may have to be considered more seriously in the future.

What should be our attitude if such patients with Graves' disease wish to marry? Exophthalmic goiter is often incurable even though the thyroid has been removed. It does not only impair the physical strength of the patient but may also exert a serious influence upon her psyche, causing various neuroses and psychoses such as hysteria, neurasthenia, hemicrania, epilepsy, melancholia and mania. Or else it may associate itself with severe vasomotor and trophoneurotic disturbances and auto-intoxications, *e.g.*, myxedema, sclerodermia, Addison's disease, diabetes insipidus and mellitus.

Furthermore, the disease has a marked tendency toward transmission to the offspring. In such instances, the exophthalmic goiter of the mother is usually inherited by the female descendants. The following is an instructive example:

CASE III.—Mrs. H. C., para-iv, was delivered of her last child eight years ago. During her pregnancy she suffered greatly from what I then thought to be neurasthenia, but what I now, in the light of subsequent developments, recognize as early manifestations of hyperthyroidism. Labor, however, took place without further complications. About three years ago the classical symptoms of Graves' disease made their appearance, and strumectomy was performed some time later. *Quite recently the eldest three daughters, sixteen, fifteen and ten years old respectively, almost simultaneously developed signs of hyperthyroidism.*

There is, then, sufficient reason to advise against marriage if the symptoms of Graves' disease are fully established.

If the affliction appear after marriage, conception should be prevented as far as possible, and if, as in my first case, the manifestations of the disease have become aggravated during a former pregnancy, tubal sterilization seems to me justifiable. The use of spinal anesthesia would eliminate to a great extent the objections against any surgical intervention in exophthalmic goiter.

I feel that in my first case such tubal sterilization should have been done at the time of the Cesarean section. As a matter of fact, I had obtained the consent of both husband and wife, but I was swayed in my judgment by the advice of a surgical friend who warned me against it. I would, however, not refrain from excising the tubes through the vagina, thereby prolonging the operation about ten minutes, if a similar case offers itself.

As stated in the beginning, my object in presenting this paper was to learn from the discussion. My conclusions, therefore, are merely tentative, namely,

1. The complication of pregnancy and exophthalmic goiter, while comparatively slight in some cases, may constitute a grave danger to the life of the mother.

2. If the manifestations of Graves' disease are aggravated in spite of medicinal and other conservative treatment, interruption of pregnancy is indicated without delay.

3. The quickest and therefore best method of interruption is by means of vaginal Cesarean section.

4. Spinal anesthesia is preferable to any other form of anesthesia in that it reduces the dangers from any operation on patients with exophthalmic goiter.

5. Girls with well-developed hyperthyroidism should be advised against marrying.

6. If Graves' disease has appeared after marriage, conception should be prevented.

7. If vaginal Cesarean section be performed, tubal sterilization should be added.

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METROPOLITAN BUILDING.

TREATMENT OF PLACENTA PREVIA BY CESAREAN SECTION, WHEN, IF EVER, IS IT JUSTIFIABLE?[1]

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In presenting for the consideration of so distinguished an audience an article on the treatment of a topic so hackneyed and time worn as that of placenta previa, the reader feels that he is possessed of considerable temerity, and his only excuse for so doing lies in the fact that in the minds of some obstetricians there still seems to be a difference of opinion in regard to the best method of procedure to be adopted when this complication is encountered.

I believe that all of us are agreed, that where a case of placenta previa is under observation and supervision from an early date, where an accurate diagnosis has been made and watchful care and prompt interference by the usual methods are pursued, that the mortality and morbidity, both maternal and fetal, are much lower than in those cases who have had one or more hemorrhages before applying for medical aid. Taken in the main, however, the figures in a large series of cases show that the maternal mortality ranges from 15 to 20 per cent. with a fairly high morbidity, while the fetal mortality runs from 40 per cent. to 50 per cent., a truly serious complication demanding the utmost care and judgment on the part of the obstetrician.

While it is not my purpose to weary you with a long series of statistical figures which you all know as well as do I, still we cannot fail to realize that with such figures staring us in the face, the ordinary routine methods of treatment by packing, hydrostatic bags, rupture of the membranes followed by various operative procedures, etc., are very far from satisfactory, and it is the purpose of this paper to try to determine whether there is not a certain class of cases which can be treated in another way, namely, by abdominal hysterotomy, thus securing a reduction in the mortality figures given.

Although this operation had been suggested many years before and occasionally rather indifferently performed later, it was in

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[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

September, 1901, that our esteemed secretary, Dr. Zinke, read an article before this Association entitled, "Is Cesarean Section Justifiable in the Treatment of Placenta Previa," in which he quoted the literature and statistics to date and placed himself on record with considerable force as endorsing the operation of Cesarean section on cases of central or complete placenta previa, especially if the patient happened to be a primipara. I cannot find that this admirable paper was received with marked enthusiasm by his audience nor that many of those present agreed with him, but rather the contrary.

In June, 1907, before the Section of Obstetrics and Gynecology of the American Medical Association, the reader presented a paper entitled, "Placenta Previa with Observations on 250 Cases," in which he advocated Cesarean section in a limited class of cases, later to be described, and his reception on this point by the members of the Section was nearly as enthusiastic as that accorded Dr. Zinke six years previously. Some of the discussers were inclined to intimate that such views savored either of the inexperienced youth or of the rabid enthusiast, but nearly all were agreed that the operation was unjustifiable, and unnecessary. The reader, however, continued in his perversity, and a year later in another paper before the same Section, this time on Cesarean section, rather timidly, it must be admitted, included certain cases of placenta previa among his indications for the operation. Greatly to his surprise, little opposition was at this time encountered and some approval expressed. Five years later, namely at the last meeting of the American Medical Association in June of this present year, we find on the program a paper devoted to the subject and expressing the opinion that the operation of choice in cases of central placenta previa is an abdominal Cesarean section. On the other hand no later than the annual meeting of this Association in 1912, Schwarz, of St Louis, formulated the conclusion that "no form of placenta previa as such ever offers a justifiable indication for Cesarean section," and "the cervical and vaginal tampon and the intrauterine use of rubber bags are safe and sufficient means for controlling hemorrhages and for securing sufficient dilatation for delivery through the maternal passages." He quotes a series of fifty-two cases, with a maternal mortality of 2 per cent., a truly remarkable showing, but admits a fetal mortality of 40 per cent. The general opinion of the meeting at this time was rather the reverse of the one eleven years before already referred to, most of the discussers favoring Cesarean section within limits.

Nothing is further from the thought or inclination of the reader than the idea of conveying to this audience the belief that he considers that all cases of placenta previa should be treated by Cesarean section.

There is still a large field for the ordinary methods of procedure which will, he believes, always continue to find a use in the majority of instances, but, given a case of placenta previa centralis in a patient with a long cervix and undilated os with or without pelvic disproportion, with the child in good condition, will the patient not make a better recovery, with a living baby quickly delivered without loss of blood, by means of abdominal hysterotomy, than by the long drawn out and necessarily enfeebling manipulations needful to dilate the cervix and deliver her child in the usual manner? We believe that she will, and we desire to report certain cases in which this operation has been done with success.

Since 1891, in the service of the New York Lying-In Hospital, there have occurred 470 cases of placenta previa, and the operation of Cesarean section has been performed for this condition nineteen times by six different operators, all since 1905. The situation of the previa was central in nine cases, marginal in five cases, and no statement as to situation was made in the history in five cases; no case was more than two fingers dilated; all had had severe hemorrhages before entrance into the hospital, and in all it was a matter of rapid delivery being considered advisable; the patients varied from para-i to para-xiv; the youngest was eighteen and the oldest, thirty-eight. As to results: of the nineteen cases operated upon, one mother died, a maternal mortality of 5.3 per cent.; two children were stillborn, and three died before leaving the hospital, two on the first day, and one on the ninth, a fetal mortality of five, or 26 per cent.

Since a reduction in mortality is the main reason for our interest in the subject, let us consider a little more in detail the cases which died.

First, the one mother: the patient was a para-i in the eighth month with a central placenta previa. She had had outside manipulation and considerable hemorrhage. The child was stillborn and the mother died of septicemia on the twenty-first day. This was probably an unsuitable case for Cesarean section under any circumstances.

The other stillbirth was a case which was operated on purely on account of the mother who, it was believed, would not stand a prolonged dilatation and operative delivery, she being a primipara with an entirely undilated cervix, who had lost a great deal of blood.

The child was believed to be dead at the time of operation. The mother made an uneventful recovery.

Of the three children dying after delivery, two died of atelectasis on the first day, and one of an infection of the middle ear on the ninth day.

It will be seen, then, that in this series the maternal mortality is cut down by about two-thirds of the usually accepted mortality, whereas the fetal mortality is cut almost in half. While the number of cases is too small to more than point the way, we believe that the indication is clear, and that when we encounter a primipara with a placenta previa either marginal or central, or a multipara with a central placenta previa in either case where the cervix is rigid or undilated, whether or not there is pelvic disproportion, provided the child is viable and the mother offers the ordinary safe operative risk, that Cesarean section holds out a better chance of saving the lives of both mother and child with fewer complications than any other method of delivery, always provided that the operation is performed by a competent and experienced operator and amid suitable surroundings.

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THE ADVANTAGE OF CESAREAN SECTION OVER OTHER PROCEDURES IN BORDER-LINE CASES.[1]

BY
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Cesarean section a few years ago was the bugbear not only of the general practitioner but of the obstetric surgeon as well, to say nothing of the general public, owing to the very high mortality both maternal and fetal.

This high mortality was largely due to the fact that, like our early operation for appendicitis, it was only done in extreme cases, and usually then as a last resort. Very few surgeons, even half a decade ago, had the courage to advocate and perform a Cesarean section in a moderately contracted pelvis until either high forceps or version had been attempted, and the chances of either a living child or an uninfected mother were very poor.

For many years the chief subject for discussion among obstetricians in this class of border-line cases, cases of moderately flat

[1] Read before the Twenty-sixth Annual Meeting of the American Association of Obstetricians and Gynecologists at Providence, Rhode Island, September 16–18, 1913.

and generally contracted or moderately deformed pelvis, has been whether high forceps or version was the safer method of delivery. By high forceps I mean forceps applied to a fetal head that is still above the upper plane of the pelvis and unengaged.

Statistics have proven that under the very best conditions high-forceps operations show an infant mortality of from 17 per cent. to 25 per cent., and that version in the same class of cases gives an infant mortality still higher, ranging from 25 per cent. to 45 per cent.

Markoe, in a large number of high-forceps cases at the New York Lying-In Hospital, has reported an infant mortality of 26.16 per cent. and Taylor in a report of the hospital tenement service makes the infant mortality for high forceps 25 per cent. Compare these reports with those on Cesarean section in the same institutions, where in 124 uncomplicated Cesarean sections up to 1908, Dr. Markoe reported an infant mortality of 2 1/2 per cent. and a maternal mortality of 6 1/2 per cent. During 1910 there were fifty-nine Cesarean sections at the New York Lying-In Hospital, out of which fifty-four mothers and fifty-one infants survived. I do not want to be understood as saying that the high-forceps operation should never be resorted to. But cases in which either high forceps or version is justifiable are very rare and are not cases where there is a marked discrepancy between the size of the fetal head and the maternal bony canal.

A recent writer criticises the dictum "Never apply forceps to the head above the brim," and says it may be a safe rule to hand to the general practitioner, but should not apply to the experienced operator. I believe this precept should be repeated often and emphatically, for it is the beginner and the general practitioner that should be taught. We must depend mainly upon the larger hospitals for our statistics and precepts, but upon the general practitioner falls the great proportion of obstetric practice. He is the obstetrician of the masses. It must be remembered that in any case of contracted pelvis, either high forceps or version is just as formidable and dangerous for the mother as is Cesarean section, beside the question of grave danger to the child. As gynecologists, we all know what happens to the vast majority of these women. After being subjected to one or more of these operations they become invalids, victims of procidentia, rectocele, cystocele, vesicovaginal or rectovaginal fistulæ, and all manner of lacerations. As for the child, should it survive, how often is it the victim of injuries from which it never recovers, and just what percentage of the idiots and epileptics that fill our public institutions can trace their misfortune to this kind of birth, it is difficult to state. In Cesarean section the mother takes the same risk that she would from any laparotomy, and at the present day that is very slight. Any isolated practitioner can in these days of easy transportation obtain competent assistance. The lapse of a few hours, more or less, need not prejudice the result. The patient can nearly always be taken in comparative comfort to the nearest hospital, but if this is not practicable, there is no more objection to doing a Cesarean section in an isolated farm house than there is in doing any other laparotomy. The writer has crossed the Hudson in a small boat late at night, ridden many miles into the country, and then spent an hour or two making preparations for the operation with results that could not be improved upon anywhere.

A general rule suggested by Dr. Norris has been accepted by all authorities, "That when the true conjugate is less than 7 1/2 cm. in simple flat, and 8 cm. in generally contracted pelvis, Cesarean section at or before the onset of labor should be the elective operation.

Now I think we should add to this that in all cases where there is a larger conjugate diameter, but where after the lapse of a reasonable time the head remains unengaged above the brim of the pelvis, Cesarean section is the safest procedure, both for the mother and child. Rules may be laid down for the obstetrician in well-marked pelvic deformities in very flat or narrow pelves, but this is by far the smallest class of cases that confronts him. Vastly more numerous are the women with moderately flat or narrow pelves, some of whom have suffered one or more previous labors, resulting in high forceps, version or even craniotomy, but always with the same result, a dead child or one that succumbed in a few hours or days.

Some of them are willing to try again, many others absolutely refuse to make another attempt, but go frantically from one physician to another seeking relief from their pregnancy, declaring that they had been warned by the last physician that attended them that they can never live through another childbirth and by all means not to make the attempt. Many of these women become regular patrons of the abortionist.

The time is undoubtedly coming when the general practitioner, the midwife, and even the patients themselves, will understand the importance of correct pelvic measurements so that these border-line cases may be recognized in time to prepare for them, but that time is still a long way off, especially in large country districts and in the small cities and towns where there are no maternity hospitals or specially trained obstetricians, and in many instances where the physician sees the patient for the first time after labor has begun.

The discrepancy is by no means always due to an abnormally narrow pelvis, but is frequently due to an exceptionally large child, out of all proportion to the pelvic outlet. It may be due to an impossible presentation or to a hyrdocephalic head or an ossified head.

There are many other conditions which should be easily recognized as indications for Cesarean section, such as cancer or other tumors of the uterus or canal, cicatricial contractions of the vagina or cervix, placenta previa, eclampsia; in mothers who have been subjected to fixation operations; in prolapse of the cord, especially where there is pulsation.

There is another condition which, if possible to diagnose, should call for immediate Cesarean section, and that is the very short cord. A short thick cord, anywhere under 8 inches in length, is an almost unsurmountable obstacle to a safe delivery and, although comparatively rare, should always be considered in extremely tedious and protracted labors, where there is no other apparent obstacle.

Some writers tell us that in many of these border-line cases by careful measurements and manipulation it is comparatively easy to determine the relative diameter of the fetal head and the bony canal, and that when the discrepancy is not too great, high forceps may be safely applied. Now, there may be a few men gifted with that degree of skill, but this is not altogether safe teaching, for where the natural forces fail to engage the head, it is not likely to be accomplished by mechanical force without serious damage to either the head or the canal, or to both. It is easy to understand how many a physician is driven to apply forceps in these cases greatly against his better judgment, by the dread of the patient and the prejudice of the family against the knife. When, however, such an emergency arises and the obstetrician feels justified in attempting forceps, let him be sure of two things: he must be clean and he must be gentle. One of the latest text-books on obstetrics describing the high-forceps operation says, "The operation as described is very difficult, especially if the degree of contraction is considerable. The obstetrician may be compelled to use the entire strength of both arms."

I believe such teaching is extremely dangerous, for it must be remembered that it is not the proper use of forceps that does the damage, it is the abuse of them. The time is past when the strongest man is the most skillful obstetrician.

However important a fair knowledge of pelvimetry may be, of far greater importance is a clean, careful obstetric technic that includes not only his own hands and person, but the person, clothing, bed and surroundings of the patient. When he has safeguarded his patient against infection, neither he nor the surgeon need feel any great anxiety about the result, if a Cesarean section has to be resorted to later.

Pubiotomy as an aid to the high forceps seems to have very little to recommend it. I have had no experience with it myself, but judging from two patients who came to me subsequent to pubiotomy operations, one with vesicovaginal fistulæ and the other with extensive lacerations, cervical, vaginal and perineal, it is not to be classed with the clean-cut abdominal section which, when carried out with a proper technic, leaves no bad results behind it either to the mother or the child.

Craniotomy upon a living child is not to be considered; the slight risk to the mother of a Cesarean section can never justify the wanton sacrifice of the child and, furthermore, the risk to the mother from craniotomy is just as great, if not greater.

The Duehrssen schnitt or the vaginal Cesarean section, a splendid procedure when the obstruction to a ready delivery is the undilated uterus itself, does not in any way enter into the question, whereas in these cases the bony pelvic canal is too narrow for the passage of the fetal head.

Accouchement forcé, or premature delivery, may be a capital procedure, especially at maternity hospitals where the physician has a perfect understanding with his patient for months before her term, but does not apply to the general practitioner whose patients are scattered over a large area where there is no chance for any preliminary preparation. In such cases I have had all my experience with Cesarean section, altogether eleven cases. The first six, all done upon either extremely deformed or extremely contracted pelves, I reported a year ago. During the past year I have had five more; four of these were what I have designated border line cases.

Case I.—Mrs. C. aged twenty-eight. Dr. C. J. McCambridge reported to me by telephone that this young woman had been in labor all day, that the child was a large one; that the head did not engage in the pelvis, and he was certain some operative procedure must be resorted to. He explained that this patient had given birth to two previous children, one by high forceps and the other by version and forceps, and that both of these children had been lost, and he was loath to attempt either of these procedures in the face of this mother's previous experiences. After seeing the patient I advised Cesarean section which was assented to. She was at once removed to my private hospital and high Cesarean section done. A fine 12-pound boy was delivered. Mother and babe left the hospital the fourteenth day.

CASE II.—Also referred to me by Dr. McCambridge, who told me he was about 12 miles in the country and asked me to come out prepared to do another Cesarean section. With an assistant and nurse I arrived at the house about 10 P. M., where I found a very large fat woman, forty years of age, with a moderately flattened pelvis. She had been in labor since early morning, but the head was not engaged in the pelvis. This mother had given birth to three previous children, all with high forceps; two had been born dead; the third had lived three days with a fractured depressed skull, and she realized that this was probably her last chance for a living child. After careful preparation Cesarean section was done at the house and a very large girl baby was delivered. Both patients did finely.

CASE III. Mrs. K. A young primipara referred to me by Dr. Dederick of Rhinebeck. The doctor had noticed no special discrepancy about the pelvic outlet until after the patient had been in labor all day, when he found the head still unengaged above the pelvic brim; high forceps were attempted but unsuccessfully. I was then called and asked to do a Cesarean section. The patient was taken to the Rhinebeck Hospital, where I found a straight moderately contracted pelvis. In this case, had the doctor used sufficient force, he might have succeeded in delivering a dead child and terribly lacerating the mother. As it was, by section we delivered a large male child which, though resuscitated with some difficulty, with the mother made a good recovery.

CASE IV.—Mrs. R. Finely developed primipara; thirty-eight years of age; had been in labor twenty-four hours when I was called to see her by Dr. Grace N. Kimball, who told me that, although the cervix had been fully dilated for the past twelve hours, there had been no progress. Upon examination I found an apparently normal pelvis and could easily make out a right brow presentation well above the brim. By bimanual manipulation a firm mass in the left pelvic fossa could be easily identified as the occiput. The patient was having severe and frequent pains which had no effect except to force the shoulder down and rotate the head further up into the left pelvis. I advised a Cesarean section, as I did not believe this child could be delivered alive by any other method. Patient was removed to my private hospital and section done at once, and a 10-pound child delivered alive. There was a moderate succedaneum of the right brow, including the right eye. The occiput was very much elongated and was flexed backward between the shoulders, remaining in this position for several days, before the baby began to show very much improvement, then the muscles of the neck and back began to relax and he began to nurse regularly and take some interest in life and by the end of the second week went home with his mother. By gentle massage and manipulation his head assumed a normal shape and the muscles of his back became normal. He is now a fine boy of ten months.

CASE V.—Mrs. L. Called in consultation by Dr. E. H. Heston, found small primipara twenty-six years old, with straight, moderately contracted pelvis. Patient had been in labor twenty-four hours, cervix was well dilated, but the head remained above the brim and unengaged. I advised that the patient go to the hospital for Cesarean section, but this was so strongly opposed by patient and family that I finally consented to try forceps as the child was a small one. I soon found that with the amount of force I was willing to exert that the head would not engage. The patient was then removed to the hospital and section was done. Neither the child, a 7 1/2-pound girl, nor the mother, suffered any ill effects from their experience, but left the hospital on the twelfth day.

In all my cases I have used the high abdominal incision, opening the uterus *in situ* as soon as it is exposed, carrying the uterine incision well over the fundus. With this incision the operation can be done through an abdominal opening about one-half the size of the lower incision, and, as Dr. Davis has said, the abdominal and uterine wounds are separated by the contraction and involution of the uterus. Another advantage is that the uterine incision is made through a part of the organ away from the larger blood-vessels, and hence there is less danger of hemorrhage, and I believe also a portion of the uterus less likely to rupture in subsequent labors. For protecting the intestines and to absorb any fluids which are likely to overflow, one or two gauze pads, 6 inches wide, 6 or 8 feet long, are useful.

This operation seems to me to be the ideal one in all cases where the operator feels confident that he has no previous infection to deal with, but in cases where there is suspicion of infection, I believe it would be much safer to open the lower abdomen, lift the gravid uterus out of the abdcmen, thoroughly protect the abdominal cavity before opening the uterus, when the operator is in a position to proceed with a hysterectomy as a further safeguard against infection.

It has been said that Cesarean section has caused a considerable number of ruptured uteri. We can safely say that timely Cesarean section would prevent most, if not all, ruptures.

It is certainly not "good obstetrics" to allow a woman who has had one Cesarean section to proceed in any subsequent labor to a point where rupture is imminent. Recent statistics, however, show that with our present technic these accidents following Cesarean section are comparatively rare.

339 MILL STREET.

THE SIGNIFICANCE OF HEMATURIA AND ITS MANAGEMENT.[1]

BY

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WHILE hematuria is of very frequent occurrence, it results from so many and varied conditions that it is often difficult and, at times, impossible to determine its exact causation, or the pathological changes from which it is derived. The exact location of the bleeding, too, is very important in arriving at a correct conclusion concerning its origin and causation. To the superficial observer this symptom assumes but little importance and may be passed over as a trivial affair, when in the great majority of cases it is a most interesting study and can lead one to the correct diagnosis of the basic condition of which it is a symptom. Blood may enter the urine at any portion of its flow, and while it has been claimed that when the blood is diffusely mixed with the urine a high origin is suggested, this condition by no means denies the presence of bleeding from the bladder. Certain forms of hematuria have been classed by some writers as idiopathic because no known lesion has been determined to account for the condition. Undoubtedly many of these cases are the result of passage of minute crystals, especially of oxalate of lime, through the urinary tract. Others have been found to result from vascular conditions in the kidney in which the vessels are so dilated that the term "renal nevus" seems to be justified. It is likely that other conditions also produce similar form of hematuria, the study of which will be taken up under the head of renal hematuria.

The study of hematuria may be classified, according to the location of the bleeding, into renal, including the kidney and its pelvis, ureteral, vesical, and urethral. According to its cause, it may be classified as follows: (1) Traumatic, including accidental injury, and also that occurring from stone. (2) Inflammatory, including acute nephritis, chronic inflammatory affections of the kidney, tuberculosis, acute and chronic inflammation of the pelvis of the kidney, ureter, bladder, prostate, and also acute urethritis. (3) Vascular, blood dyscrasia, such as hemophilia, etc., and nevi, venous obstruction of the kidney, especially that due to torsion in mobility of the kidney; hydronephrosis, varicosity of the vesical veins, especially that due to prostatic engorgement. (4) Chemical, in which class should be placed hemorrhage from irritating drugs, as turpentine, cantharides, etc. (5) Toxic, in which the hemorrhage is the result of vascular changes occurring in severe toxemias, such as that resulting from malaria, acute yellow atrophy of the liver, yellow fever, scurvy, pregnancy, etc. (6) Neoplastic. (7) Parasitic.

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Renal hematuria is probably the form most interesting to the surgeon. Lacerations of the kidney—gunshot and stab wounds—frequently cause hemorrhage which appears in the urine. In many of these cases the damage done to the kidney is slight, and all that is necessary in the management of the case is to put the patient at rest in a recumbent position, when cessation of the bleeding frequently occurs. If, however, the bleeding persists, or there are marked evidences of shock, operative interference will be demanded.

David Newman reports a very interesting case resulting from a gunshot wound of the left kidney. The primary hematuria disappeared, recurring seven years later and continuing so long as the patient was moving about, but was promptly relieved by rest. Nephrotomy and decapsulation gave only temporary relief; nephrectomy was followed by a cure. From the history given in this case it seems possible that the final hematuria, which was the result of a varix, had but little relation to the primary injury to the kidney.

The presence of a stone in the kidney or the renal pelvis is a frequent source of hemorrhage. The amount of blood is sometimes small in quantity and may be increased by walking or riding or any violent exercise. Sometimes it is accompanied by pus, while in others there is no infection. Crystals of oxalate of lime, uric acid, etc., are frequently seen in the urine of these patients. Eshner reports (*Jour. A. M. A.*, May 9, 1903, p. 1326) a case of renal calculus with hematuria in which after the kidney was exposed and found apparently healthy and left undisturbed, the symptoms permanently disappeared. He has collected from the literature a number of similar cases and concludes that there are occasional occurrences in men and women alike, mostly at middle adult life, of hemorrhage from a single kidney—from either with equal frequency, in many instances in consequence of demonstrable organic disorder, and in the remainder of obscure and undetermined origin. This hematuria may cease after simple exposure of the kidney or after nephropexy or nephrotomy, or in the failure of these, after nephrectomy. Since the preparation of his paper he has come across the report of an additional case in which slight mobility of the kidney was accompanied with profuse hematuria.

Tuberculosis of the kidney presents hematuria as an early symptom, the amount of blood varying very greatly in different cases. In some instances a few isolated red cells are found, in others a profuse hemorrhage and even blood casts are found. Pyuria and dysuria frequently accompany this form of hemorrhage. Tuberculous hematuria is most likely to be met in patients of from twenty to thirty years of age.

Hematuria is often an accompaniment of an acute nephritis. In some cases it is caused by a bilateral nephritis, only one kidney bleeding; and in cases of unilateral nephritis hematuria may be the only sign of the condition, the lesions in the affected kidney consisting of circumscribed areas of sclerosis and of acute and chronic diffuse nephritis. A case of this kind is reported by Johnson (*Surgical Diagnosis*, vol. ii, p. 512).

Vascular hematuria results from changes in the renal vessels, especially the veins, from obstruction to the venous circulation, nevi, varicosities, etc. Also those hemorrhages which result from a blood dyscrasia, such as hemophilia, etc.

Ingestion of certain drugs, such as turpentine, cantharides, copaiba, etc., in toxic doses frequently produces hemorrhage from the kidney. In therapeutic dosage such result does not obtain. The intravenous use of hebdonal in the production of anesthesia in large amounts (10 per cent.) has been known to produce hemoglobinuria. The chemical products of severe toxemias, such as that resulting from malaria, acute yellow atrophy of the liver, yellow fever, scurvy, etc., produce so much damage to the walls of the vessels of the kidney that hematuria is a not unusual accompaniment of these conditions. In severe burns the toxic product has also been known to produce this symptom.

Tumors of the kidney of all forms are usually first detected by the presence of blood in the urine. Angiomatous growths of the pelvis of the kidney, while very rare, are also causative of this symptom. The hemorrhage from a malignant tumor of the kidney will rarely persist for more than two or three years. Should a tumor continue to grow and the hemorrhage to persist for a longer period than this the growth is probably hypernephroma.

The development of hematuria in children is always suspicious of a renal growth, although the same symptom is met in Barlow's disease. The hematuria occurring in connection with tumors of the kidney is usually painless in character and unaccompanied by pus or crystalline elements in the urine.

Parasites.—A few parasites produce hematuria. Among these may be mentioned distoma hematobium, prevalent in Egypt, Cape Colony, and other parts of Africa. A few cases have recently been found in this country. A new blood fluke is recorded by Catto, in *British Medical Journal*, Jan. 7, 1905, which causes renal hemorrhage. He found adult trematodes, male and female, in the blood-vessels, the ova in the uterus of the female corresponding in every particular with the oval bodies found in the various viscera. The life history of this new schistosome corresponds with that of other trematodes, especially the S. hematobium. It differs from the latter in that (1) the habitat of S. hematobium is said to be venous only, whereas the habitat of the new schistosome is mainly arterial; (2) the ova of S. hematobium affect mainly the urinary system and escape from their human host by this channel. In the new species the ova apparently affect exclusively the alimentary system, escaping by this route from their human host. The geographical distribution differs, for no case of bilharziosis has yet been met in China. Catto describes the new organism in detail.

Formerly the term "essential renal hematuria" was applied to those conditions in which the pathology was somewhat obscure, and a large number of cases were included under this head. Similar cases have been described as functional, painless and symptomless hematuria. Undoubtedly there are some cases of renal hemorrhage in which a most careful and painstaking analysis cannot discover a pathological lesion as the cause, the only condition present being hemorrhage without other symptom of renal disease, and in the absence of any pathological change in the kidney it seems to the writer that the term "essential renal hematuria" is best suited to cover this class of cases which in our increasing knowledge will become smaller from time to time. The term "symptomless" seems to be a misnomer.

Among the conditions which have formerly been overlooked as causative factors in this type of renal hemorrhage are hematuria from prolonged muscular effort, usually confined to a single attack, also a varicose condition of the veins of the renal pelvis or a single papilla has occurred. A very interesting case of this kind came under the observation of the writer. Fenwick, David Newman and others have reported similar cases.

Schuller reports a number of cases to show the errors liable to be made on the assumption of "essential hematuria," etc. Cases of doubtful character have been designated by some writers as hysterical hematuria, nephralgia, angioneurotic hematuria. Under the head of "Paroxysmal Hematuria" Thompson describes this disorder as a profound neurosis, chiefly affecting the vasomotor system and called into activity by exposure to moderate degrees of cold, by muscular fatigue, or mental emotion.

Hematuria in Hydronephrosis.—Bangs discusses hematuria as a symptom of hydronephrosis. He states that a thorough and careful review of the literature failed to discover any cases of this kind except in one instance. In a series of forty cases, among which there were nine presenting hematuria as a symptom, he adds one case to the list in a patient of nineteen. The hematuria was intermittent, variable in quantity, increased by slight trauma, such as jolting in a wagon and by manipulations of the kidneys necessary to a diagnosis. He lays stress on hematuria as a symptom of hydronephrosis. The writer has observed this symptom in one case of hydronephrosis of large size resulting from stone.

Hematuria in Pregnancy.—Hematuria occurring in pregnancy may result from pressure upon the veins of the kidney or upon the vesical veins. Hemorrhage may occur from either one of these locations. In cases of intense toxemia resulting from this condition the occurrence of hematuria is not unlikely.

Ureteral Hematuria.—Hemorrhage from the ureter occurs as a result of traumatisms incident to calculus, in some cases of hydronephrosis, and as a result of traumatism in catheterization.

Vesical hemorrhage may result from inflammatory changes in the bladder wall, traumatisms incident to instrumentation, dilatation of the vesical veins due to inflammatory conditions in the prostate gland, and from tumors causing pressure upon the vesical neck, from pregnancy, also from papillomatous growths in the bladder and from malignant disease. Hemorrhages from the urethra occur as a result of traumatism, inflammation, constriction, passage of stone, and presence of foreign bodies.

Diagnosis.—The diagnosis in this condition has for its object the discovery, first, of the blood in the urine, and, second, of the source of the hemorrhage. The presence of blood in the urine may be told by its color and by chemical and microscopical tests. The presence of red blood cells in the microscopical field are characteristic and distinguish true hematuria from hemoglobinuria.

Renal hemorrhage presents the blood thoroughly mixed with the urine, giving uniformly red, smoky or brown color. If the hemorrhage is from stone the amount is usually small and will appear at more or less prolonged intervals. Repeated urinalyses of over thirty days' duration will almost certainly detect a few blood cells if calculus is a causative factor.

The hemorrhage from tuberculosis of the kidney occurs either in the early stages from congestion of the surrounding renal tissue, or in the latter stages from rupture of the tuberculous focus into the pelvis. Hemorrhage is present at some time in all cases of tuberculosis of the kidney. It is usually accompanied by pyuria, frequent passage of a large quantity of urine, and also painful micturition.

Vesical hemorrhage is found especially at the end of the urinary act, the first urine may perhaps have been clear. In some instances the urine is bloody throughout. Clots are very frequently present in hemorrhage from the bladder. Hemorrhage from the urethra is frequently noted apart from the act of micturition and bleeding continues for some time after the bladder is emptied.

Before the introduction of the cystoscope the diagnosis and location of the hemorrhage usually depended upon the time of its appearance, its character and the shape of the clots, but these are misleading at times and by means of the cystoscope and ureteral catheter the source of the hemorrhage can usually be determined without difficulty. In order to determine the underlying causative condition and to make a differentiation between renal calculus and renal tuberculosis skiagraphy is an invaluable aid. Tubercle bacilli can be detected after sedimentation of urine. At times, however, repeated examinations must be made before this organism is found. In a doubtful case it is well to inoculate an animal and notice the development of a tuberculosis.

Prognosis.—Prognosis depends upon the source, cause and quantity of hemorrhage.

Treatment.—The most important thing in the treatment of all forms of renal hemorrhage is rest in bed and the local use of the ice-bag. Morphia is to be administered to quiet the nervous system of the patient concerning the hemorrhage. Adrenalin, ext. hydrastis, hamamelis, gallic acid, lead acetate, chloride of calcium and ergot have all been recommended in this condition. The writer has found turpentine in small doses to be the most satisfactory of all internal remedies. In the hands of some tincture of cantharides in two to five drop doses has been found to be of service in relieving renal congestion. R. L. Rigdon (*Amer. Journ. of Urology*, April, 1910) suggests the employment of the injection of medicinal substances into the renal pelvis to control papillary hemorrhage, as a diagnostic measure. Undoubtedly such a plan will be more productive of harm than good. Hugh Young has employed adrenalin injected in this way to control the hemorrhage. The injection of horse serum, properly employed, may be productive of benefit. Hemorrhage produced by parasites is best relieved by the internal administration of parasiticides. Fouquet affirms the value of the extract of male-fern internally in this form of distomiasis.

Surgical Treatment.—This depends entirely upon pathological cause and the site of the hemorrhage. In hemorrhage from the kidney resulting from stone, tumors, traumatism of persistent type, and unilateral tuberculosis, operative intervention is demanded. The procedure employed must meet the conditions found on the table. Some cases of bilateral tuberculosis of the kidney improve markedly upon usual methods of treating tuberculosis, as fresh air, sunlight, proper diet, light exercise and rest. The internal administration of creosote and small doses of turpentine are valuable adjuvants. Varix and nevi are at times relieved by nephrotomy, nephropexy, by splitting the capsule, or, as in some reported cases, simply by cutting down upon the kidney and lifting it from its bed. The exact *rationale* of the result in the latter is not apparent.

Hydronephrosis needs appropriate treatment. Stone demands removal from the pelvis or ureter. Inflammatory conditions in the kidney are treated according to usual methods. Ren mobilis producing hematuria demands fixation. The treatment of ureteral hemorrhage is carried out along the same lines employed for that from the kidney. Hemorrhage into the bladder is in almost every instance a surgical affection. Some of the smaller papillomata can be removed by an intravesical operation through the cystoscope. Small bleeding points may be successfully cauterized. The larger number of cases, however, will demand a cutting operation for relief, such as for stone, benign and malignant growth, enlarged prostate, as well as intractable cases of cystitis and rupture of the bladder from traumatism. Inflammation of the bladder will usually respond to local treatment. In some patients it can only be relieved by drainage. Many cases of vesical tuberculosis recover fully after the removal of the tuberculous kidney. Urethral hemorrhage is to be treated along the usual lines.

THE ATHERTON.

ACUTE UNILATERAL HEMATOGENOUS NEPHRITIS.[1]

BY
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ACUTE bilateral nephritis of hematogenous origin has long been an object of medical knowledge. In fact, the prevailing opinion, formed from both pathological and clinical studies, is that acute nephritis of hematogenous origin is always bilateral. This is in a large measure true when we find it as a complication or sequela of scarlet fever, diphtheria, small-pox, typhoid and other infectious diseases. The infection in these cases is carried to the kidneys by the blood stream, and while the disturbance in the kidney is caused by the toxins, which, at times, do cause cellular necrosis, yet it is rare that suppuration occurs, and the resultant kidney lesions remain within the medical category.

But there is a rarer, more serious type which is of interest to the surgeon, in that it attacks a person apparently well, often without warning, and may present a typical picture of certain of the grave abdominal emergencies, such as appendicitis, cholecystitis or visceral perforation. While these cases are regarded as rare, to have met with four cases within a period of a year leads one to the belief that acute unilateral hematogenous infection of the kidney is a much more common disease than is generally supposed and considering the fact that two of these cases were previously diagnosed as appendicitis justifies one's suspicions that they are not, as a rule, recognized by the profession at large. A hasty review of the literature on this subject corroborates this opinion, for Brewer who first recognized the surgical importance of the subject says: "Of nine cases which came under my observation, only one came in with a diagnosis of renal infection." In 1908 Cobb presented a series of eight cases operated on in the Massachusetts Hospital by himself and colleagues and reviews previously published data. Since then, however, reports have been few and scattered, but if we judge by the number of demonstrated cases in the hands of a few men, these cases cannot be unusual.

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Acute suppurative nephritis of hematogenous origin is a condition resulting from the infection of the kidney by certain microorganisms, in particular by the pyogenic cocci and the colon bacillus. It is of a metastatic nature and, when developed in both kidneys, is generally consecutive to a septic process or a specific infection somewhere in the body, so while it is well understood that in the presence of a septic focus elsewhere, metastatic or embolic abscesses may occur in one or both kidneys, it is not so well understood that an individual apparently well and in whom no septic lesion can be demonstrated may have an infection of the kidney with one or more septic infarcts or abscesses. It is a well-known and generally accepted fact, that during the progress of any infectious disease a certain number of microorganisms find their way into the blood stream. It has also been shown by numerous experiments that these organisms are excreted through the kidneys; if their number is small, their virulence low, and the kidney healthy, the transit of these organisms through the renal apparatus gives rise to no demonstrable lesion. If, on the other hand, their number is many, their virulence high, or if one or both kidneys are diseased, lesions are produced which may vary from a slight cloudy swelling to a destruction of the organ by necrosis.

The pathology of acute unilateral hematogenous infection is entirely different from the bilateral kidney infections. The lesions most commonly found in these cases (unilateral) are due to a plugging of the small arteries and capillaries with groups of organisms surrounded by a zone of round-cell infiltration and are of two distinct types:

1. Abscess formation.
2. Diffuse inflammation without tissue necrosis.

In the abscess type the kidney is somewhat large, congested and with minute abscesses seen beneath the capsule and throughout the cortex. From here other portions of the kidney are involved, forming parenchymatous abscesses which may ultimately coalesce and rupture through the capsule, giving rise to a perinephritis, or into the pelvis giving a typical picture of pyelonephritis. So severe is the toxemia in these cases that the resistance of the individual must be great, and the virulence of the infective organism of so slight a character before this cycle can be completed, that death usually intervenes before the process reaches the extensive abscess stage.

The form of organisms usually producing this type of infection are the pyogenic cocci, the staphylococcus albus and aureus, the streptococcus pyogenes.

The second type of the disease, the diffuse inflammatory, has a diffuse inflammation spreading through the kidney, but does not result in focal necrosis or solution of tissue. The lesion consists of inflammatory exudation, endothelial leukocytes with fibrin formation and a few polymorphonuclear leukocytes. The kidney is large and congested. In the early stages of the process there are irregular purplish areas under the capsule. These areas are of much the same character as presented by the normal kidney in rough handling and bruising during the ordinary operations on it. On section the organ is found to present irregular, circumscribed, reddened or yellowish areas involving the cortex and pyramids or involving the whole kidney without any solution of tissue. In some instances the whole kidney is covered with these purplish areas and the split kidney may present an acutely reddened surface due to the involvement of the whole organ. Until the experimental research work of Buxton, Torrey and Cannon, it was thought that when large numbers of bacteria were in the blood, whether by a general infection or experimentally by injection into the veins or the peritoneal cavity, that most of the bacteria passed through the kidneys were eliminated through the urine, and that the disturbance to the kidneys was great. The work of these men proved, however, that the majority of organisms introduced into the circulation were destroyed before reaching the kidney, and while many bacteria were eliminated by the urine, it is unusual for bacteria to lodge in the kidney, provided the kidney and ureter were normal.

Sampson performed a series of experiments on dogs in which he tied the ureter of one kidney and injected pure cultures of staphylococcus into the jugular vein. He found that bacteria were eliminated by the urine and only in those cases in which the ureter was tied did the kidney become infected.

Brewer followed these experiments by injecting bismuth into the pelvis of the kidney and ureter and subjected the kidney to various forms and degrees of trauma. In a large number of these cases lesions were produced in the injured kidney identical with those of his clinical cases.

These experiments point a way to the understanding of the workings of clinical conditions as factors in the etiology of kidney infections. Most cases are probably unilateral in the beginning. A source of infection must exist somewhere in the body, although it is not always easy to ascertain the focus. Since the colon bacillus is the most prolific source of infection we may infer, with reason, that intestinal stasis, a break in the intestinal mucous membrane, or even in long-continued constipation, the bacteria pass through the intestinal wall in large numbers.

The bladder, the prostate, the uterus and its adnexa are additional possible sources of bacterial infection of the kidney through the blood. In addition to the entrance of infection there must be some cause, traumatic or otherwise, operating to reduce the resistance to renal tissue. The kidney may have been injured by a fall or a blow upon the loin; it may be prolapsed or rotated on its axis, so that the circulation is deranged, or the ureter may be abnormal due to stricture or some deformity encumbent on pregnancy or childbirth.

Sampson has demonstrated that the blood-vessels of the kidney communicate with the bladder, aside from the general circulation, through two other channels, the uteroovarian and the vessels of the ureter itself. By injection he demonstrated a free arterial anastomosis between the branches of the renal artery supplying the capsule of the kidney about its lower pole, the kidney and the branches of the ovarian artery. The ovarian artery has a free anastomosis with the uterine and the vesical. This anastomosis is both venous and arterial, so it is therefore possible for a septic focus in the bladder, uterus or the adnexa, to infect the kidney by way of the general circulation or through anastomotic channels directly.

With these preliminary remarks on the pathology and etiology, I would like to report a small series of cases, four in number, in which the operative findings of three illustrate the diffuse inflammatory type and which, at the time of operation or subsequently, had not reached the stage of abscess formation or solution of renal tissue.

Case I.—Mrs. George S., aged twenty-two, came to the hospital on September 18, 1912 with a diagnosis of appendicitis. Previous history negative, except that six weeks previously she had been confined, but with a puerperium normal in every way. She was suddenly seized with pain in the right lower quadrant of the abdomen. The chief point of tenderness was a little higher than McBurney's point. The chief characteristic about this woman was her very acutely ill look, her face suggestive of a typhoid or pneumonia. Examination of pelvis negative, abdomen rigid over right rectus and painful to the touch. Tenderness over the costovertebral angle. Temperature 104°. Pulse 130. Urine examination showed albumin positive, a few red blood cells, a few degenerated leukocytes, and a few granular casts.

Diagnosis.—Acute infection of the right kidney; operation advised, but refused until twelve days later. In the meantime, the temperature for the first four four days was between 103 and 104°; for two days it ranged between 99 and 101°. It then reached 103° for a few days, dropping to 101°, where it remained with evening rise until the operation.

During this time the bladder was examined and the ureters catheterized. Bladder negative. Urine from the right kidney showed albumin, pus cells, red cells, and a few casts. Urine from left ureter normal.

Obtaining consent to operate the usual incision for kidney exposure was made. The perirenal fat was edematous, the kidney was congested, and covered here and there with purplish spots about the size of a finger nail. The capsule was stripped, drainage instituted, and the wound closed. There was considerable temperature reaction following the operation, the temperature going to 103°, remaining at 102° with remissions for four days, when it reached normal in seven or eight days following operation.

Case II.—Mrs. J. W., aged thirty-two. Was suddenly seized with pain in the right loin and right side. She was sent to a hospital in a neighboring town with a diagnosis of appendicitis. She had a temperature of 103°. Pulse 120. Respirations 26. Three days after admission she had a chill lasting ten minutes. For three days after the chill the temperature remained at 104°, with slight morning remissions. The temperature was very irregular from that time, ranging from 98° morning to 103° evening until eighteen days after admission. She was tender and rigid over the anterior right abdomen, especially over the lower part of the ascending colon. There was marked tenderness over the costovertebral angle. Urine had shown albumin, pus cells, and red blood cells. This patient looked markedly toxic and prostrated and seemed a very poor risk for any surgical operation. The usual kidney incision was made and kidney exposed. The kidney was large, about one and a half times its usual size, and was studded with red purplish spots under the capsule. Owing to the size of the kidney and the marked toxemia in this case, it seemed possible that embolic abscesses might be present in the interior. The kidney was, therefore, split along its convex border from pole to pole. No abscesses were found, but wedge-shaped areas were found with their bases at these purple cortical spots. The capsule was stripped, the kidney drained and sutured. Four days after the operation she had a chill followed by a temperature of 106°. After three more chills on two successive days her temperature came to 100°. Here it fluctuated between that point and normal for seven days when it reached normal and remained there.

Case III.—Mrs. O. T., aged thirty-two. Married. Seven months pregnant. In the last three months has had several attacks of pain in the right loin. A few days before admission has had pain in the right side of the abdomen with fever, nausea, headache and prostration. Temperature 102°; pulse 140; respiration 28. Urine examination showed albumin, a few pus cells, and a few red blood cells. Examination of the abdomen showed tenderness over the right side below the margin of the ribs, rigidity of the upper rectus and tenderness in the costovertebral angle. On exploring the right kidney by lumbar incision it was found enlarged and congested. Several small purplish spots were found under the capsule. The capsule was stripped, the kidney drained. The temperature came to normal on the eighth day and the fistula closed two days later.

CASE IV.—H. B., aged seventeen. Female. About two months ago fell and struck her right side. Her side was sore for a day or two, but it quickly passed away. Three weeks after she had severe pain in the upper right loin and abdomen. Temperature 104°; pulse 110; leukocytes 23,000. She had been in bed a month when I first saw her, during which time her temperature had ranged from 100° morning to 103° evening. During the first week of her illness her urine showed nothing pathological except a low specific gravity and a few white blood cells. After a week's duration urine showed albumin, a few pus cells and a few red cells. Catheterized specimen of urine from right kidney showed slight trace of albumin, pus cells, a few red blood cells. Left kidney normal. Pus showed Gram positive bacilli in chains and Gram negative cocci in chains. Phenosulphophthalein test showed right kidney (one-half hour collection) 2 per cent. Left kidney 10 per cent. Physical examination showed pelvic organs normal, tenderness over the anterior upper abdomen and in the costovertebral angle.

Although this patient's symptoms persisted, her temperature ranging from 104° evening to 100° morning, she refused operation and after seven weeks her temperature reached normal.

Diagnosis.—The diagnosis of these acute cases is not, at first sight easy. The disease may be preceded by a chill, which, with the initial high temperature, rapid pulse and intense toxemia may suggest pneumonia, grippe or one of the exanthemata. The sudden acute abdominal pain, tenderness, muscular rigidity, high temperature and pulse, with a high leukocyte count, may suggest almost any of the grave abdominal emergencies. Fortunately, however, careful palpation in the region of the kidney will furnish evidence of kidney involvement. I have found costovertebral tenderness in all of my cases. This symptom has been so constant in Brewer's series that he regards it as a pathognomonic sign.

In a large majority of the cases a careful examination of the urine will show albumin, pus, and blood cells. In the less acute cases the condition of both kidneys should be investigated both by catheterization and by the x-ray.

In the acute cases, however, which may simulate any of the abdominal crises and where the urine shows neither pus, blood nor albumin, and the kidney shows neither enlargement nor tenderness, it is justifiable to make a preliminary anterior incision to prove the diagnosis and establish the existence of the other kidney.

Treatment.—The treatment of these cases is essentially surgical.

There are, however, cases that recover without operation, as, for example, Case IV; and as noted by Cobb, Brewer and Cunningham, even in acute fulminating attacks. There are, however, cases of acute appendicitis that recover, but we never know that they will. Just what is the operation of choice depends on the type of infection and the pathology found on exposure of the kidney.

In the acute cases, with multiple miliary abscesses and from which an overwhelming toxemia results, nephrectomy must be the operation of choice, if we would save the patient's life.

Of the fourteen cases of this type encountered by Brewer, two were untreated, and in four nephrotomy with drainage was done; they all died. The remaining eight were treated by nephrectomy with recovery in each case.

In the acute diffuse inflammation of the kidney the treatment is not so well defined and must depend more on the course of the disease in the individual case. In those cases where the areas of infarction are very numerous, to such an extent that the function of the kidney is seriously impaired, and when the toxic symptoms are very pronounced, nephrectomy should be the operation of choice. For example, while Case II in the above report recovered with nephrotomy and drainage, her convalescence was stormy and not without grave danger. Were I to repeat this operation, nephrectomy would be the choice.

In cases where the infarcts are few in number, the toxemia is mild and the general condition of the patient good, splitting of the capsule with drainage of the diseased areas should be considered. Cases are on record, however, in which the symptoms have recurred after this operation and in which a subsequent nephrectomy was necessary.

308 Diamond Bank Building.

TRANSACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

DISCUSSION ON THE PAPERS OF DRS. DAVIS, MCPHERSON AND POUCHER.

Dr. Charles N. Smith, Toledo.—I did not intend to open the discussion on these papers because I have had no opportunity to prepare for it. However, there were some things said in the discussion on Cesarean section, especially as regards placenta previa, that I would like to consider.

One remark which impressed me very favorably, without referring to the patients who accept our decision, is that we can do abdominal delivery as readily as forceps delivery, and it is really remarkable how readily patients at the present time not only accept Cesarean section but request it. In my opinion, when they accept Cesarean section as opposed to high-forceps delivery, they invariably chose the safer of the two procedures.

There is one question I would like to ask Dr. Davis, which was not mentioned in his paper, and that refers to the condition of the child delivered by Cesarean section. In what proportion of children delivered by Cesarean section is there a delay or difficulty in establishing respiration?

Personally, I have had quite a bit of difficulty. I have done twenty-three abdominal Cesarean sections, two of these were done in the presence of placenta previa centralis, one of them particularly for that sole indication, and the other in the presence of transverse presentation in a woman who had lost three children previously in labor and who solicited this Cesarean section.

The first case was a woman, twenty years of age, who was seen at St. Vincent's Hospital, having had a profuse hemorrhage. She was a primipara, with a very small vagina, long, conical, rather firm cervix, with not much dilatation, and placenta previa centralis. We did immediately an abdominal Cesarean section, and saved the mother and the child.

The second case I wish to refer to especially was a woman, thirty-two years of age, on whom I did Cesarean section last May. She had been confined previously at three different times, once with transverse presentation, others with breech presentation. In the transverse and one breech presentations the child was delivered dead. In a third breech presentation, the child lived for some few moments only, so that she had lost three children in delivery, and in February or April she, unknown to her attending physician, intended to have Cesarean section performed this time; that she was going to have a living child if possible. I saw her and arrangements were made according to this plan. If she had a head presentation, it was thought best to allow her to deliver herself or to do it by forceps. If she had an irregular presentation, or if there were any complications which led us to believe she could not be safely delivered of a living child, Cesarean section must be done, and arrangements were made to take her to the hospital to have this done. She was taken with slight pain and profuse hemorrhage in the night, and I was quickly notified and called to see her. I found her with very little pain, with dilatation of about an inch, the head in the left iliac fossa, the back anterior, the occiput anterior, and the placenta seemingly occupying the entire lower segment of the uterus. She was bleeding rather profusely, although the pains were not hard. She was taken at once to the hospital, we did a Cesarean section, delivered her of a living child, and her life was saved, so we had in that particular case what I hold to be the proper indications for Cesarean section for placenta previa and some other indications. In this case she had the history of repeated fetal death, a transverse presentation, which might have been later, had other conditions been normal, a placenta previa centralis, the patient at full term, the mother being an ideal surgical risk, and a living child, with the patient in the hospital. I believe it is in those cases of placenta previa only, where we have a placenta previa centralis that Cesarean section is absolutely indicated. Possibly in some instances of placenta previa marginalis it might also be indicated. I have done it in placenta previa centralis, and certainly the results to the child must be considered. We have got to consider the unborn child, and the chance of the mother to be delivered of a living child, and do Cesarean section in some instances of placenta previa, even though we are practically sure we can save the mother's life by other methods of procedure.

Dr. James A. Harrar.—I have had the pleasure of seeing Dr. Davis do a great many Cesarean sections, and I might say there is no better operation. At the New York Lying-In we all follow his technic. I have made twenty-three Cesarean sections, using Dr. Davis' incision, with perfect satisfaction.

As to the condition of the scar in subsequent pregnancies, it is something we should consider when we recommend Cesarean section, especially in the cases long in labor where there is a suspicion of infection. We know in doing a vaginal Cesarean section how prone the uterine wound is to slough in the presence of infection. In these late cases, where we do abdominal section, we often get a similar sloughing of the uterine wound, so that in future pregnancies we have a weak uterine scar.

In a study of the uterine scar following Cesarean section made several years ago, we found absolutely no scar tissue between the visceral peritoneum and the uterine mucosa, where the wound had healed by primary intention. The uterine muscle was solid throughout the wound, the muscle cells having apparently regenerated and many of them could be seen under the microscope running directly across the line of the old incision, as located by the linear whitening on the peritoneal surface.

As to the employment of the operation in placenta previa, we are confronted with a problem that requires careful consideration. The mortality figures in placenta previa are notoriously of little value, because we do not know the condition in each case, how it was handled before it came to the operator's hands. Among a series of 460 placenta previas which I had occasion to report recently from the Lying-In, there were forty-eight primiparæ that were delivered by the vaginal route. Of these, one mother died and thirty babies were lost. Cesarean section has little better than this to offer as far as the mother is concerned, but it does increase the chances for the child. On the other hand we must know the value of the child thus delivered alive by Cesarean section. As but a third of women with placenta previa go to term, we must anticipate an infantile morbidity of 66 per cent. from prematurity. Personally I would limit the indications for the operation in placenta previa to primiparæ with long and but slightly dilated cervices, the mother at or near term, and with mother and child in good condition.

Dr. H. G. Partridge, Providence, R. I.—I did not expect to be called upon to take part in this discussion, but I am very glad to be here and to have heard these papers. I heard two of the papers, but not all of the one read by Dr. Davis.

I am especially interested in the subject of Cesarean section for placenta previa, because it seems to me, placenta previa is one of the most serious conditions we have to meet. I have never seen a Cesarean section done for that cause. I have seen cases of placenta previa that showed a long rigid cervix, but these have been very few. Practically all the cases I have seen have had a soft, boggy, easily dilatable cervix, and within my own personal experience there has been no case which I have thought, after hearing these papers, would have been suitable for Cesarean section. Within a week we had a case in the Lying-In Hospital here which would have been ideal for vaginal Cesarean section. Vaginal Cesarean section was done, the mother being in good condition afterward and the baby born dead.

Another thing to consider is that many of these cases are premature; that is to say, the baby is not more than six or seven months old, and if you deliver by Cesarean section, you do not get a viable baby. That is a point we have to consider. I cannot help but feel—perhaps I am a little conservative—that there is more danger in doing a Cesarean section than in doing a high forceps. As I have seen high forceps done by men competent to do it in patients who are not already too weakened, there has been very little mortality, whereas there is a distinct mortality in any abdominal section. That is my own conclusion from observation.

Dr. E. Gustav Zinke, Cincinnati.—It is only natural that I should take an interest in this subject; an interest, indeed, which has been earnest, serious and protracted. No doubt there are a good many cases of placenta previa which had better be treated by

Cesarean section from the beginning than by any other method. No man is a good obstetrician, or a good surgeon, who is guided by one rule only. Every man must study his cases carefully and then he must determine, from the conditions with which he is confronted what is the best course to pursue. The signs and symptoms are the witnesses, and he the judge. There are, undoubtedly, many cases of placenta previa, perhaps the majority, that can be successfully treated for both mother and child, by the Fry or the DeLee method, by balloon and, even by metal dilatation. I have very little use for the latter mode of dilatation.

When we are able to observe these cases constantly, and have them in favorable surroundings, we may see what we can accomplish by way of dilatation of the os and delivery of the child *per vias naturales*. But when we have a case of placenta previa centralis, complicated by an oblique or transverse presentation, the most skilful use of the tampon will do no good; and, before you succeed in dilating the uterus sufficiently either by this or any other method, the woman is usually so exsanguinated that, if she does not die during the delivery, she may expire soon thereafter or go by way of septic infection a few days later. The child, as a rule, is lost under these circumstances. Version and slow delivery of the after-coming head always means death to child.

In primiparous women, the victims of placenta previa centralis and an oblique presentation, I would not attempt anything except a Cesarean section. There are cases of marginal and lateral placenta previas in which, at times, the hemorrhage is difficult of control. These are the cases in which a pathologic condition exists. The placental structure is not limited to the decidua serotina but is so implanted that the chorionic villi penetrate the uterine musculature; here, separation of the placenta is very slow and always associated with great loss of blood.

Under normal circumstances, the uterine wall is of the same thickness in every part of the organ, the placental site not excepted. Normally the placenta does not occupy the muscularis at all, only the serotina. In normal placental implantation, the hemorrhage is hardly ever excessive and can usually be controlled. But when the placental villi have buried themselves into the uterine musculature, we have free and uncontrollable hemorrhage, and a timely Cesarean section will save both mother and child. With the other methods, just enumerated, you will have a fatal result from the start so far as the child is concerned; and, in many instances, the life of the mother too is sacrificed.

No man has a right to perform Cesarean section who is not able to provide the patient with the necessary aseptic precautions and who is not thoroughly familiar with the technic of the operation.

Every case of placenta previa is a serious surgical case and belongs in a hospital as truly as a case of appendicitis or any other grave surgical condition. If the diagnosis of placenta previa is made early, there is no good reason why the patient should not be sent to a hospital, even though it be ten, twenty, or fifty miles from the patient's home.

The diagnosis of placenta previa can be made, in some instances during the period of viability, and nearly always some time before the beginning of labor. If the condition manifests itself late in the ninth month, or when labor begins, it may still be possible to convey the patient to a hospital if it be conveniently located.

It is quite a satisfaction to me to be understood at last. I do not claim the credit of having been the first to advocate Cesarean section for placenta previa. I have been only one of the pioneers fighting for the justification of this operation in this serious obstetric complication. Lawson Tait was the first to suggest it. The operation was performed in St. Louis by Hypes, and Hulbert in 1890; by Slight, Granite City, Montana, 1891; by Bernais, St. Louis, 1898; by Lawson Tait, the same year; by Donoghue, Boston, 1900; by Hare, Boston, 1901; by Covington, Bellfontain, and by Gillette, Toledo, Ohio, 1901. In spite of the fact that the operation was performed late in every one of these cases, only three mothers died and all children lived. I know of no surgical conditions in which the results have been so favorable from the beginning, as in cases of Cesarean section for placenta previa. Since then the operation has been accepted, at home and abroad, by many operators. It is now performed quite frequently for the relief of this condition and, almost without exception, with favorable results to both lives concerned.

Just a word with reference to Cesarean section for eclampsia. I have put myself squarely on record on this question. Cesarean section is rarely, if ever, justifiable for this condition. There might be a justification for this operation in eclampsia had we no other means to obtain far better results in the treatment of this malady. It is a pity, indeed, that a remedy, which has served hundreds of good and able practitioners well for the last sixty or seventy-five years, should be so utterly discarded and shamefully neglected by some of our best men at home, and by nearly everybody abroad. It seems that the obstetricians of the continent of Europe especially have no faith in the value of veratrum viride in the treatment of puerperal eclampsia. They do not even speak of it. Veratrum viride, a fresh preparation of it, promptly and properly employed, rarely fails to give prompt relief. Indeed, I have never seen it fail in any case in which it was used properly from the start. There are cases of eclampsia which cannot be cured by any form of treatment. They are fatal from the start. Those are the cases due to an effusion or hemorrhage into the brain or spinal cord or both, and those which are caused by yellow atrophy of the liver. No remedy, not even Cesarean section, will cure these cases. I feel almost certain that the cases, which will not respond promptly to the proper administration of veratrum viride, cannot be saved by Cesarean section. Still I am in favor of this operation if veratrum viride has received a fair trial and the patient does not respond. Under such circumstances I would have no objection to Cesarean section;

although I have my doubts whether the patient will profit by it. My friend, Reuben Peterson, with whom I had a controversy on this subject in Rochester, N. Y., last April, says: "Dr. Zinke will try veratrum viride until the case is hopeless and then make a Cesarean section." He does not put me on record squarely. I protest against his statement. I have never seen a case in which the first hypodermic injection of twenty drops of veratrum viride did not at once affect the patient favorably; the pulse becomes better and the general condition of the patient is almost invariably improved. So long as the patient's consciousness returns after every attack, so long as her pulse remains normal, just so long is there little danger even if the attacks recur. I am satisfied there are men in this audience now who have seen patients, having from five to ten, and more, attacks of eclampsia, whose mind cleared up perfectly after every seizure, even without the use of veratrum viride, and then deliver themselves. If I had a case in which the first eclamptic seizure left the patient's mind cloudy and that after the second or third attack the coma increased, I would consent to a Cesarean section, though with little hope of saving her life.

Veratrum viride should have a fair trial. It is our duty to use it. We owe it to those brave and good obstetricians who have preceded us, and who have spoken in favor of this drug in words of eloquence the like of which we rarely hear. We owe it to the memory of these earnest truthful men for the sake of suffering womankind, that we perpetuate this remedy; and that we continue to remind those who have no faith in it, that it is a remedy of more than ordinary merit.

DR. McPHERSON (closing the discussion on his paper).—There are only two points I want to refer to in connection with what has been said. Dr. Harrar quotes forty-eight cases of placenta previa with one death among the mothers. I agree with him perfectly about that, but these are forty-eight cases of placenta previa. They are not forty-eight cases of central placenta previa in primiparæ. They are not within the limits of the rule or statement which I laid down for the indications. If I had said in my paper that I thought every case of plaecnta previa ought to have a Cesarean section done that percentage would be absolutely out of proportion but we do not now how many of those forty-eight cases were cases which met the indications which I gave, so that I think there is room for some argument.

The next point is with reference to the remarks made by Dr. Partridge, namely, how to keep premature babies alive. They are hard to keep alive, but a premature baby, whose mother has been fourteen hours in labor, and in a gradually increasing state of exsanguination, is harder to keep alive than one delivered directly after the diagnosis is made, and we must not think that every premature baby is bound to die, because we have saved a great many of them in private practice. In cases of placenta previa a great many premature babies die, on account of the prolonged labor.

Dr. Davis (closing the discussion on his part).—As to the remarks made by Dr. Smith relative to the establishment of respiration of these children following Cesarean section, we find comparatively very little trouble in that respect, and yet every now and then we do see cases of children where they do not breathe well for some cause or other, but the proportion is rather small. I recall two cases in which I left the operation for ten minutes, stopped it altogether, in order to come to the rescue of the child. Those were cases where we had intense uterine contractions, so that the uterine wall was contracted and thick and there was practically no bleeding. We placed a pad over the wound, left the mother temporarily, and took care of the child.

In relation to the uterine scar, we have done these operations repeatedly upon the same patients and in many of them we are unable to find the scar at all. In a great many cases we find it is strong and firm. A week ago I found one case where the region of the old Cesarean wound was evidently fully as strong as the rest of the uterine tissue. We make it a point to go directly through the scar. We believe it is better in these operations to have one location of scar tissue rather than two or possibly three with short muscle fibers growing between them. In one case of rupture of the uterus, the scar withstood the strain and the rupture took place down in the thinned out lower uterine segment.

Dr. Partridge is to be congratulated upon the ease with which he does high forceps, because we do not find it such an easy operation in the cases that come to us in New York.

There are indications for high forceps, I grant, and there are some cases where the high forceps is a good instrument. Take, for instance, a woman with a large flat pelvis, a multipara, with lax abdominal walls and lax uterine walls, where she does not engage the head, where one or two pulls of the high forceps overcomes the obstruction, and brings the child down into the pelvis easily, it is all right, but high forceps, as we understand it, is one of the most dangerous operations we have anything to do with.

The remarks made by Dr. Zinke as to placenta previa were very interesting. I have seen a number of cases that were not central, but were well-marked marginal cases of placenta previa, where, I believe, Cesarean section was a very much better operation than in some similar cases where a Cesarean section was not done, where so-called dilatation was tried and the patient died. I believe such cases would have been saved by Cesarean section. As a matter of fact, we do not dilate as much as we may think we do. We hear a good deal about dilatation of the cervix. We do not dilate, it is a matter of laceration. Up to three or four fingers' dilatation, the lacerations are not pronounced, but they are still there, and if you extend the dilatation to what we call full dilatation the lacerations are extensive. After that, dragging the child through the canal, we have quite as much laceration as we care to deal with.

With reference to the abnormal location of the placenta it was remarked at one of our meetings years ago by some one that cases of placenta previa should be classed as ectopic gestation. Dr. Zinke brought out the point that the placenta is located in an abnormal part of the uterus, and he has observed it correctly. The placenta sends digitations into the muscle and the muscle is weakened, so that after the placenta is removed we get hemorrhages from the placental site because of its inability to contract. We cannot pack, we cannot sew against that, as the tissues are lax and flop about. The muscles do not contract. The woman has already had considerable hemorrhage, and after hemorrhage has taken place, in our attempt to repair there is still bleeding, and many of these women die.

Cesarean section is a comparatively easy operation, and the surgeon does not necessarily need to be trained as an obstetrician in order to perform it. Any surgeon who is accustomed to doing abdominal operations finds no difficulty, I am sure, in doing a clean-cut straight-away Cesarean section, and it is a safer operation than any vaginal delivery of the operative type in many of these cases.

Dr. Poucher (closing).—I do not feel that I can add very much to the argument made by Dr. Davis on this subject. I do not think any of us can say too much upon the subject of Cesarean section because, first, it seems to me, the more it is discussed, the more it is studied, the more there is printed on the subject, and the pros and cons thoroughly understood, the better the chance in educating the general practitioner as to the necessity for it in a great many of these cases, especially cases in which the general practitioner is apt to apply high forceps.

Now, I cannot agree entirely with Dr. Partridge about high forceps being as good a procedure in some cases as Cesarean section. I used to apply high forceps a good deal. I used to dread a Cesarean section as an operation. At the present time, I dread a good deal more applying forceps to the head above the brim of the pelvis than doing a Cesarean section, and I feel the patient is freer from the danger of infection and in better condition. There are a great many mothers who, it seems, have more difficulty than others. The uterine canal to all appearances may be normal, but these mothers have the habit of having children that are too large for the canal. There are certain mothers who run to large children, particularly a mother that weighs 80 or 100 pounds. I have known several instances, two cases in particular which I reported, where a mother lost two children by an attempt at high forceps, and the other lost three, because the infants in everyone of these cases were out of proportion to the size of the canal, which was not markedly contracted. Some of these cases are easily delivered perhaps by high forceps, but the majority of them, as Dr. Davis has said, we can meet much better by a Cesarean section, done before we have complications.

DISCUSSION ON THE PAPERS OF DRS. SHERRILL, FOSTER, SANES AND FURNISS.

Dr. G. Van Amber Brown, Detroit, Michigan.—These four very interesting papers have covered the field pretty thoroughly, yet there are some points I would like to touch upon and emphasize.

First, concerning essential renal hematuria, that is usually unilateral and associated, as a rule, with pain. It is not due to any well understood cause. The condition occurs in both men and women. It occurs usually between the ages of twenty and forty, and very frequently, not always, in those under thirty years of age. It occurs in apparently normal kidneys. Hale White has recently reported a series of cases from which he cites five of renal hematuria. In these he could find no pathological lesion of the kidney whatever. These cases do not seem to be hemophilics because they do not bleed elsewhere. Furthermore, it does not follow through families as hemophilia does. They are not cases usually that give a history of having had injuries. They cannot be classed as suprious menstruation, because they occur in men as well as women. Speaking of them as being angioneurotic and neuropathic does not enlighten us a particle.

I think it was Senator who examined a number of these kidneys after operating, he found there was no indication of disease of the kidney either microscopical or macroscopical. He does find that by simply cutting the kidney or doing a nephrotomy these cases are cured.

Recently I have had three cases of hematuria that, by every manner and means, following them out with *x*-ray examinations, catheterizing the ureters, making a microscopic examination of the urine, chemical analysis, etc., I could not get a single sign of disease except one symptom, that of bleeding. It may be unilateral, but sometimes it will be on the right side and at another time at the left side. I had one case, a man, forty years of age, in whom I thought the trouble was in the left kidney. Two or three days later the right one was bad and the left one acting normally, I gave him an injection of a few minims of normal horse-serum to test for sensitization and followed it an hour later with 10 c.c. and the bleeding stopped, but recurred. Afterward I found he was a gormandizer, and when I limited the diet he did not bleed.

The two other cases were men, one twenty years of age, the other forty-five, the latter had been bleeding for five years. I saw him last December, and although he does heavy work, he like the other, has not had any recurrence of the trouble whatever. Their bleeding stopped permanently after the use of 10 c.c. normal horse-serum given hypodermically. I believe that in some of these cases the hemorrhage is due to a toxemia. I forget the name, but some of you were at Minneapolis attending the meeting of the American Medical Association and will probably recall at the scientific exhibit one exhibit made by some Chicago man. He has been for ten or eleven years injecting bacteria into the blood stream and growing vegetation upon the heart. In many of these cases he gets hemorrhage of the kidney, and says the intima is affected in some way so as to produce kidney hemorrhage. A man with a curved spine, a distorted or supernumerary rib, in assuming certain positions may bring pressure upon the renal vein and produce bleeding.

Dr. Henry Dawson Furniss, New York.—I am interested in these hematuria cases, but I will confine my remarks to those not due to tuberculosis, tumor or stone, but to that class usually called essential hematuria.

I have had ten of these, seven unilateral, three bilateral. There of these were decapsulated with a cessation of bleeding in all.

Two unilateral cases were decapsulated with no benefit: in them subsequent nephrectomies were performed. In one of these nothing was found by careful microscopical examination. In the other there was evidence in the pelvis that the hemorrhage was of submucous origin.

In one unilateral case the bleeding ceased after ureteral catheterization.

I have only recently seen a case of profuse unilateral hematuria, but as yet we have not studied it sufficiently to determine its cause.

One bilateral case died without operation, with all the evidences of chronic nephritis. In another bilateral case the bleeding from both kidneys ceased after the decapsulation.

The third bilateral case was seen during pregnancy, during which time the hemorrhage continued; since then there has only been a slight amount of blood in the urine.

It is admitted by many that chronic nephritis is seldom if ever confined to one kidney, but that the hemorrhage in these cases of chronic nephritis is usually from one kidney. In making the diagnosis in these cases, we have examined the urine from the nonbleeding kidney, and in nearly all the cases it has shown evidences of nephritis.

Dr. Foster has given us a very valuable paper on renal infections. I have been very much interested in postoperative renal infections, and at the last meeting of the American Medical Association presented a history of ten such cases. The infection in these cases occurred from five to twenty days after operation. They were more frequent in those cases where the operation was upon the intestinal canal or the perineum. I believe the condition is due to the breaking up of infected thrombi and metastatic lodgment of emboli in the kidney.

In reference to the paper by Dr. Sanes, I disagree with him in regard to the steady flow of urine from the ureteral catheter as evidenced that the catheter is in the renal pelvis. I have had a number of cases where there has been a continuous flow from the ureteral catheter when it was only 4 inches in the ureter. It is very difficult to estimate the size of the renal pelvis in the manner that he has described in the pyelograph. In this we have a method that shows the amount of dilatation and the nature of its cause.

Very frequently we are unable to diagnose ureteral obstruction with the ureteral catheter, as there are a number of instances of stricture in which there is no resistance offered to the passage of the catheter. In these cases I consider pyelography the only sure method of diagnosis.

Dr. David Hadden, Oakland, California.—I would like to endorse the position taken by Dr. Sherrill.

In reference to the paper by Dr. Sanes concerning the use of the renal catheter, I will say that I have done considerable work lately on the kidney, and I have found in those cases where there is a dilated kidney pelvis, from that side you get a continuous drop. I do not think we can consider it diagnostic of kidney trouble by passing a catheter up into the pelvis of the kidney.

Dr. Sherrill (closing the discussion on his part).—I have been especially interested in the subject of what has been called essential hematuria or the symptomless hematuria, having exhausted all methods of determining the cause and then finding when you cut down, in some instances, dilated veins, and in other instances you find nothing. It seems to me, many of these cases are due to minute crystals passing through the kidney; others are due to congestion produced by disease of the lungs or cardiac lesions, as mentioned by Dr. Furniss in one of his cases, causing damming back of the blood in the renal vein and twisted pedicle of the kidney. Many of these conditions clear up by the manipulation of the kidney itself, especially those due to torsion of the kidney from displacement. I think that a study of this class of cases will clear up to some degree our knowledge of the pathology. Some of them are undoubtedly due to inflammation of the kidney structure and we have operated upon them, and the amount of tissue taken away for examination has been too small to give a good idea of the exact pathology.

Dr. Sanes (closing the discussion on his part).—One of the reasons for the presentation of this paper is the fact that analyses of bladder-urine and *x*-ray examinations are not always sufficient to clear up the pathology of the kidney and ureter, and that by the use of the catheter a diagnosis can be made that cannot be reached otherwise. Exception was taken to the mode of differentiation between the character of the flow of urine from a catheter inserted in the pelvis of the kidney and the flow from catheter inserted in the ureter. It is true that occasionally we find a continuous flow from a catheter inserted in the ureter, especially when the patient catheterized is nervous or has a hydro-ureter. But even in such cases if you leave the catheter in the ureter long enough the continuous flow becomes in time intermittent.

As to the renal capacity, it is not an easy matter to investigate it, consequently it is essential to use every possible method to determine it. With the catheter in the pelvis, if we press on the kidney and obtain a continuous flow or stream, we know we have residual urine and by injecting a fluid in the pelvis of the kidney we get a general idea of its capacity. There are cases of relaxed kidneys without any definite pathology (especially in nervous people) that will admit a considerable quantity of urine. Again healthy kidneys may give us only a few drops of urine on catheterization and cause severe colic on injection of a very small quantity of fluid. But such cases are rare. As a whole, the great value of the catheter cannot be disputed.

We spoke of the value of pyelograms and showed, among other abnormalities, strictures. Mention was made, during the discussion, of the fact that the catheter does not always show a stricture. This is true, but it is also true that by the aid of the catheter a stricture can frequently be discovered that cannot be discovered otherwise. Recognizing the value of the renal catheter we have been in the habit of practising the following routine investigations in cases of bad kidneys: We introduce a catheter for an inch in the ureter and obtain urine for analysis. Then we pass the catheter into the pelvis of the kidney, and if no ureteral obstruction is found, we obtain a pelvic specimen of urine. If it is important to decide the question of renal function, the phenolsulphonephthalein test or any other of the efficiency tests is employed. We inject into the patient phenolsulphonephthalein, and obtain through the catheter the necessary specimen for the function test. An *x*-ray picture is then taken of the ureter and kidney. After this we inject into the renal pelvis a 5 per cent. solution of collargol to its full capacity and take another radiogram. We then have two *x*-ray pictures—one of the catheter (we always use an *x*-ray catheter) showing the course of the ureter and any stone which might be in the course of the ureter or in the renal pelvis, and the other, the pyelogram and a ureterogram, showing the shape, size and location of the pelvis of the kidney and ureter. Such an examination is of great value because in some of these cases not only can the diagnosis be made by the findings but definite operative procedures may sometimes be outlined by them, as shown in the pictures which were projected on the screen.

DISCUSSION ON THE PAPER OF DR. MORRIS.

DR. G. VAN AMBER BROWN, Detroit.—The particular point I wish to bring out is in regard to the etiology of these cases; is it due to visceral intoxications, that is, inflammatory changes, that we have these distortions, or are they due to certain mechanical interferences? If we study the course of the lymphatics we find that the flow of lymph is from the intestinal wall, and if changes are not produced in the lymphatics, it would lead us to believe they are not toxic. If we look to the circulation we find the blood-vessels in the course of these peritoneal bands are linear. They are not such as we find in ordinary inflammatory disturbances. The appendix is said to be a frequent cause of this trouble, and yet so often we find in the so-called Lane's kink or Jacksonion membrane that the appendix is perfectly free. It is not only free, but is normal in every respect. Gray and Anderson who have studied this have come to the conclusion that the Lane kink is due to the folding or rotation of the viscera which takes place in the early part of life. The cecum, for instance, in dropping down back of the peritoneum twists it in such a way as to produce these tugging bands. Where we find the Jackson membrane, the omentum, instead of extending only across the transverse part of the colon, descends far down upon the ascending colon into the region of the cecum, that is apparently what Jackson has described, simply this omentum extending farther down along the colon than is usual.

Mayo believes these distortions to be purely mechanical, the result of faulty embryonal development; it seems to me that instead of the viscera tugging on the peritoneum and producing these bands, really what takes place is that the bands by tugging on the viscera produce the ptosis.

As to the treatment we find that these peritoneal coverings are not tight upon the intestinal tract but are freely movable and by simply incising the peritoneum we are able to replace it in such a way as to get rid of this tension and to cover over portions that have been denuded. Sometimes though this cannot be done, and the thing to do then is an ileosigmoidoscopy, as Dr. Morris suggests.

DR. EMERY MARVEL, Atlantic City.—Whenever Dr. Morris presents a subject he calls our attention to something that is new, and I am sure that others have listened to his contribution with as much interest as I have. Whenever he presents a paper he stimulates us to think. Whether we think with him or against him, it is immaterial. As a student of Dr. Morris I have been inclined mostly to think with him.

As regards the causes operating to produce this stasis, or delayed circulation in the intestinal tract, I am inclined to think that Dr. Morris has offered a very feasible explanation.

As to the operation, I want to make one or two comments. As to its uniqueness, no one can doubt. As to its simplicity, it appeals to us. As to whether it brings about the result which is aimed at, I am in doubt. It is open to objections to my way of reasoning. The short-circuiting from the ileum direct into the sigmoid is objected to because it will not permit the individual in which this short circuiting is done to properly assimilate his or her nutrition. I should fear a persistent diarrhea, in which ingested food would pass out before assimilation took place. The colon is the absorptive part of the bowel, as I understand it, and when we have a fecal fistula, and it is from the ileum through the abdominal wall, it is not likely to close and the nutrition of the patient is defeated. This is a matter which appeals to me for consideration and warrants proof to the contrary before I should practice the operation.

A second point is this: are we going to get away from the bacterial theory operating as described by Dr. Morris? When we leave the transverse and ascending colon open with moisture and some food getting into it, are we not presenting that patient with the most prolific breeding place that it is possible for her to have? We would have deprived that patient of the rapid current to drain that very space and induced increased stosis. That, it seems to me, is worthy of some consideration and needs to be studied.

A third point is putting an unnatural opening into a tube that has a natural course and not defeating the natural course while that communication is open. In a gastroenterostomy, the opening is likely to close when the pylorus becomes sufficiently patulous for the natural current.

These comments, it seems to me, are worthy of some consideration before one adopts this operation described by Dr. Morris.

Dr. Thomas B. Noble, Indianapolis.—I wish to relate my experiences along this line. They have been of exceeding interest to me, and I am doubly interested in the report made by such an observer as Dr. Morris.

I have been, in a way, experimenting relative to methods of overcoming faulty colonic drainage, and I am getting away from colonopexy entirely, and am more and more leaning toward short-circuiting. I have a young woman in the hospital at present who had this operation done. Another young woman has gained thirty pounds in the last six months after having had exactly this type of operation. She had a dilated kink, a faulty colon, with a chronic mucous colitis. This operation was done upon a doctor's wife eight months ago, who has improved in her general physical welfare. Her condition was one of chronic mucous colitis, with bad colonic drainage, the result of an ovariotomy done by a member of this association a number of years ago in the old way of *en masse* ligation, which was followed by exudation and pelvic adhesions which bound down the head of the colon, omentum and sigmoid in the pelvis and produced distinct colonic interference.

I am pleased so far with the clinical results of short-circuiting. I have not, of course, done such an operation as Dr. Morris has described, nor is the technic of my work at all that of Dr. Morris. It requires, as I have timed it, eight to twelve minutes to do a 3-inch anastomosis here. The incision in the head of the colon goes clear down to the appendiceal attachment which is removed, so that there is no pocket or eddy left in the intestinal current at the most dependent portion of the head of the colon.

There occurs to me a matter relative to the method of Dr. Morris that I think also important, and that is the danger that may arise from the foramen produced by the union between the sigmoid and head of the colon and mesentery. There is by such a method as Dr. Morris has adopted such a foramen formed there, which, it seems to me, might become dangerous if a few coils of small intestine should slip underneath and become distended, and become obstructed. I do not know about that. I have not allowed such a foramen to remain in my cases, but have obliterated it by sutures from the mesenteric part up to the line of anastomosis.

Dr. Walter C. G. Kirchner, St. Louis.—Those who were present yesterday will remember I showed a picture of obstruction of the bowels due to kinks, and Dr. Morris' remarks have been directed to that phase of obstruction. You will remember the ascending colon and cecum were covered by a membrane, and kinks were present in the hepatic and splenic flexure, and with a sagging of the transverse colon a complete obstruction had resulted. All of this, I think, was the result of the process explained by Dr. Morris.

In regard to the treatment of the condition a number of points have been brought out. In reference to the nutrition, in the experience we have had where the colon was entirely excluded, we found that the colon was not nearly so valuable to the economy as we had supposed, and I can recall quite a number of cases in which total exclusion of the colon had been made and the nutrition seemed but little if at all impaired. In the operation that Dr. Morris has explained we have a lateral anastomosis, and we also have the loop or foramen Dr. Noble has described. I think these two features should be considered in regard to the technic. There is danger of obstruction and such cases have been reported. There is this to be said in regard to anastomosis. It has been found that end-to-end anastomosis is a very much better procedure than lateral anastomosis, as far as intestinal function is concerned, that is, the peristaltic wave passes more rapidly with end-to-end anastomosis than when lateral anastomosis has been made.

However, I believe the operation suggested by Dr. Morris is better than the suspension operation and is a rational procedure.

DR. E. GUSTAV ZINKE, Cincinnati.—Before Dr. Morris closes the discussion, I would like to ask a question with reference to the retention ability of the fecal contents after operation.

DR. MORRIS (closing the discussion).—With reference to the remarks made by Dr. Brown, he noted a point I made in regard to the embryonic character of these tissues. The omental remains simply belong with a number of other embryonic relics which are left over and increase, under the influence of mechanical stress or toxic impression, as the case may be.

With regard to the actual results, practically all of my patients who have been subjected to this operation or to a similar process have gained from 5 to 35 pounds in the course of three or four months but some have not been made comfortable. The reason I am not reporting a number of these cases is that my operative work is in a process of evolution still. I began by joining the sigmoid to the ileum or the sigmoid and cecum, and have done so many varying operations that it is not yet time to make a report upon later operations that I have chosen to make during the past year. Two of the patients operated upon in June wrote me this month. Both of them are pleased. One has gained 20 pounds, while the other has gained much in weight and says she never felt so well in her life. She had a chronic prolapse of the bowel, the transverse colon, for years. She had not been able to dance for years. Sometimes I do Dr. Longyear's operation in addition to suspending the transverse colon away above the omentum. I began with the hammock operation of Coffey. It is useful in selected cases.

Dr. Marvel thinks that unless we defeat the natural course of the bowel contents the opening will gradually close. That is true, I have sought to give sufficient angulation and fixity of the sutured angulation to make permanent valves above and below in order to defeat that natural course and at the same time not cause intestinal obstruction.

Dr. Noble speaks about the foramen which is left after bowel junction has been made and the danger of obstruction. I have been aware of that. This foramen is large, however. I have had patients make an effort at sudden coughing or vomiting during an operation. The patient has sometimes forced her ileum down through the foramen and my impression is this foramen is so large that peristaltic progression will carry the bowel back and forth as I have seen it do in the course of an operation. If the patient becomes pregnant, the uterus would probably rise anterior to the point of anastomosis, but that I do not know. The Lane anastomosis is not so very different. We assume the uterus will naturally rise anteriorly to the point of anastomosis.

Dr. Kirchner speaks about the matter of kinking the bowel. By making this artificial kink, suturing it with two or three sutures, we can retain the two limbs of the ileum and the two limbs of the sigmoid in their respective positions. The permanent kink does not seem to cause trouble. Should it do that, I would unkink the kink by putting the patient in the Trendelenburg position perhaps. I have been called several times in consultation in cases in which the patients had angulation of the bowel at some point of inflammatory adhesion, and have been called to operate in cases of postoperative intestinal obstruction a number of times. I have simply put these patients up in the Trendelenburg position and changed the posture, giving them light massage, and the violent peristaltic movement has ceased and relief has been afforded at once without need for operation in some of these cases.

In regard to the disposition of contents of the ileum, the patient may have from three to ten movements a day for the first few days. They will gradually drop down to about three. They will remain at from one to three movements a day after that. That is the common history.

An instrument in the rectum is a very annoying thing, but if we stretch the sphincter before its introduction, we do away with that. These are practical points in connection with the work.

EDITORIAL.

The American Journal of Obstetrics is the official organ for the publication of the Transactions of many organizations devoted to Gynecology and Obstetrics. In response to criticisms by several of these societies of advertisements which have appeared for some time in our advertising pages it has been decided to discontinue, at expiration of their contracts, a very considerable number of advertisements in accordance with the strictest existing standard in such matters.

Accordingly our subscribers will notice a considerable diminution in the number of advertising pages in this issue. In the January number there will be a much larger shrinkage, since most contracts expire with the end of the year. The loss of returns from so considerable a volume of advertising as must be discontinued will be a serious matter unless the medical profession will support the American Journal of Obstetrics more actively in future. The possibility of publishing a high grade monthly, printed and illustrated in the best style, without the revenue derived from numerous advertisements is largely an experiment, and it now rests with the medical profession, in whose interests the change is made, to do their part in its justification.

REVIEWS.

EARLY PULMONARY TUBERCULOSIS. Diagnosis, Prognosis and Treatment. By JOHN B. HAWES, 2d, M. D., Assistant Visiting Physician, Director Tuberculin Department, Massachusetts General Hospital; Secretary Board of Trustees, Massachusetts Hospitals for Consumptives. With preface by RICHARD C. CABOT, M. D., Assistant Professor of Medicine, Harvard University. 114 Pp. New York: William Wood and Company, 1913. $1.50.

All meat and no shell, this little volume contains in the briefest possible form the important facts concerning early pulmonary tuberculosis. The writer aims to combat the idea that discovery of tubercle bacilli in the sputum or the presence of marked signs of consolidation are essential for diagnosis. His remarks on history-taking, symptoms, physical signs and treatment are intensely practical. Each chapter ends with an excellent summary of essential facts. In emphasizing the great importance of temperature and pulse changes and loss of weight and strength rather than of physical signs the author stands on ground which cannot be disputed. He discusses the value of tuberculin and of the *x*-ray in diagnosis in adults and children. The work seems to be built around the statement, which will not be questioned by those of large experience, that in the presence of symptoms which suggest the existence of early pulmonary tuberculosis the burden of proof that, the disease is not present rests upon the medical adviser, and that in the absence of proof to the contrary, treatment for tuberculosis should be instituted at once. Appendices include typical case reports, radiographs, remarks on sanatoria, and directions for living and sleeping in the open air. H. D.

HANDBUCH DER FRAUENHEILKUNDE FUER ARZTE UND STUDIERENDE. Edited by C. MENGE and E. OPITZ, with 374 illustrations, many in color. Wiesbaden: J. F. Bergmann, 1913.

In the present work the editors and publishers have sought to produce a manual of the diseases of women which shall meet the modern requirements of the practising physician and the student. It consists of a collection of monographic essays on the various topics which are usually included under the term gynecology. The relations between medicine as a whole and this particular specialty is frequently emphasized in the hope that it will afford the gynecologist an insight beyond the borders of his field as thus related to general medical practice. A number of well-known writers and investigators have contributed to the book. Tandler contributes the introductory article on embryology and anatomy while Schröder and Menge describe the physiology of the female generative organs. Baisch discusses general symptomatology including disturbances of secretion and menstruation, together with a reference to the significance of pain. One of the most interesting and valuable chapters in the book is that by Walthard on the relations of general diseases to affections of the generative system. The connection between the various sensory organs and the latter is daily receiving greater attention, and this is in accordance with the more modern theories of the close relationship between these as well as other physiological and anatomical centers. The heart and blood-vessels, lungs, kidneys, digestive tract, nervous system, and particularly the glands with internal secretions unquestionably transmit their disturbances to the generative tract and *vice versa.* This chapter and the one following on the influences of diseases of the generative system and those of the surrounding organs, by Opitz, are worthy of the attention of American readers as, aside from Howard Kelly's text-books, these subjects have not been accorded sufficient importance in this country. A word of praise may also be extended to the chapter on methods of gynecological examination, by Sellheim, which is very comprehensive, including not only the generative organs but also the closely related uropoietic tract. In a very satisfactory chapter on venereal diseases, by Füth, attention may be directed to the excellent colored illustrations of these lesions. The chapters on gynecological therapeutics and asepsis and antisepsis are succeeded by the "Special" portion of the book which is again divided into systemic and organic diseases. Sterility is discussed by Baisch, gonorrheal diseases by Amann, venereal disorders and tuberculosis by Füth, septic infections by Opitz, injuries, etc., by Knauer, malformations by Pankow and pathological malpositions of the female genitals by Halban. Jaschke contributes the sections on diseases of the vulva and vagina and Opitz considers the anomalies and diseases of the uterus, including malignant growths. Von Franque discusses diseases of the tubes and ovaries, Buettner, the affections of the female urinary organs and finally Opitz, the intestines. The repetition of certain subjects is unavoidable in a work of this kind but does not constitute a fault of any moment. Taken as a whole, the work must be regarded as an excellent and complete presentation of the modern knowledge of gynecology as practised by its German exponents and may therefore be regarded as more or less national in its expression. A word of commendation must be added in praise of the printing and illustrations. The latter are characterized by clarity and novelty, the pictures, being largely new and with few exceptions, have not appeared in other works, a fact for which the reader ought to be grateful in view of what we often meet with in our American text-books.

Der Gynakologische Untersuchungskursus am Naturlichen Phantom als Erganzung und Ersatz der Untersuchungsubungen an der Lebenden. (A System of Gynecological Examinations Carried out on a Manikin.) By Prof. Dr. L. Blumreich. With 105 illustrations. Wiesbaden: J. F. Bergmann, 1913.

This recently issued work ought to meet with the attention of the American medical profession as demonstrating what can be done in the field of gynecological instruction through the medium of a very cleverly devised manikin. The author believes that it is possible to gain very satisfactory knowledge by this means as compared with the employment of a living subject. After detailing the sources of error in a course of instruction of this kind, Blumreich describes the preparation of a gynecological phantom from the dead subject. The soft parts of the pelvis are removed and the remaining tissue covered with a specially prepared parchment-like material. For the further details of the author's method, the original work must be consulted and reference made to the original illustrations, which are very clear and satisfactory. To this phantom, the pelvic organs may be attached and the whole is then mounted on a special stand. Blumreich has worked out a very elaborate schedule of examinations in which his so-called "natural manikin" may be employed and in which all the various gynecological conditions, susceptible of instruction by this means, are carefully described. The author must be commended for the care and thought which he has given to the preparation of this manikin, which affords apparently a very novel and satisfactory method of instructing the student in gynecology and represents a most important advance in teaching. One of the great advantages claimed for the method is that the gynecologic examination of patients is thus avoided and that the student can always confirm by inspection what he has determined by palpation. Whether a mechanical contrivance can ever serve as a substitute for the living patient, may perhaps be questioned, but the contrivance developed by Blumreich must be accepted as a much more satisfactory substance than any other hitherto proposed and when properly employed will undoubtedly fill a long-desired want.

The Principles and Practice of Gynecology for Students and Practitioners. By E. C. Dudley, A. M., M. D., Ex-President of the American Gynecological Society; Professor of Gynecology Northwestern University Medical School; Gynecologist to St. Luke's Hospital, Chicago. Sixth Revised Edition. Octavo of 795 pages, with 439 illustrations and 24 full-page plates in colors and monochrome. Philadelphia and New York: Lea and Febiger, 1913. Cloth, $5.00, net.

From the appearance of the first edition fifteen years ago Dudley's text-book has held a foremost place among American works on gynecology, and held it because its teaching has been extremely practical and marked by a rare discrimination.

This sixth edition keeps the same plan as before of arranging the subjects in pathological and etiological sequence. For example, infections and inflammations are brought together, so that vulvovaginitis, metritis, salpingitis, ovaritis, and peritonitis may be studied in the combined forms they usually assume. In the same manner tumors are treated in another part, traumatisms in another, and displacements in another. Under this plan, which the author has consistently followed from the first edition, the student never loses sight of the correlation of morbid processes to each other.

There is evidence throughout the whole work of very thorough and careful revision, and much new material has been added without increasing the size of the volume. Many new illustrations and plates have been included to explain operative procedures. The general appearance and make-up of the work is the same as in the fifth edition.

ANATOMY, DESCRIPTIVE AND APPLIED. By HENRY GRAY, F. R. S., Fellow of the Royal College of Surgeons; Lecturer on Anatomy at St. George's Hospital Medical School, London. New American Edition, thoroughly revised and reëdited, with the ordinary terminology followed by the Basle anatomical nomenclature. By EDWARD ANTHONY SPITZKA, M. D., Director of the Daniel Baugh Institute of Anatomy and Professor of General Anatomy in the Jefferson Medical College of Philadelphia. Imperial octavo, 1502 pages, with 1225 large and elaborate engravings. Lea and Febiger, Publishers, Philadelphia and New York: 1913. Cloth $6.00; leather $7.00, net.

Measured by the number of students who have used it, Gray is incomparably the greatest text-book in medicine. Its author combined two faculties, either sufficient to make him famous, he was a great anatomist and a great teacher. His original text was unequalled in clearness and united with it was a series of unequalled illustrations. He devised the method of engraving the names of the parts directly upon them and was also the first to employ colors. On its original appearance half a century ago it immediately took the leading place which it has maintained through all the subsequent editions. In the present revision the editor has supplied such facts and views as the advances in the science of anatomy have rendered it necessary to incorporate. Descriptions of undue length have been curtailed and difficult passages in the text clarified, so that the essentials are here embodied into a fairly complete account of the structures of the human body and their development. Under the heading of applied anatomy many important medical and surgical considerations are discussed. In the use of descriptive terms, concerning which widely different opinions prevail, the editor has sought to take a middle course, employing designations sanctioned by usage in current medical literature. The *Basle Nomina Anatomica* nomenclature, in italics, has been added in parentheses, except where the two nomenclatures are identical, and the terms are listed in the general index. Illustrations have been added from original drawings and preparations, and some from standard works, whenever it seemed that any important point could be made more clear. Colors are abundantly used and dissecting directions accompany the descriptions of the parts. The whole book is thoroughly organized in its headings and the sequence of subjects so that the student receives his knowledge in its anatomical dependence. As a teaching instrument the new Gray's Anatomy, embodying all that careful thought and unstinted expenditure can combine in book form, comes close to perfection.

REFERENCE HAND-BOOK OF THE MEDICAL SCIENCES. Embracing the entire range of scientific and practical medicine and allied science. By various writers. First and second editions edited by ALBERT H. BUCK, M. D. Third edition, completely revised and rewritten, edited by THOMAS LATHROP STEDMAN, A. M., M. D. Complete in eight volumes. Volume II illustrated by numerous chromolithographs and seven hundred and fifty-four fine half-tone and wood engravings. Volume II, pp. 832, quarto. William Wood & Company, New York: 1913.

The second volume of the Handbook includes the subjects from Baden-Baden to chloroform. It bears evidence of most careful and thorough revision and holds well up to the very high standard set by the first volume. A large proportion of its articles have been entirely rewritten. Many short titles have been added and many new illustrations. There is a place waiting for a work of this kind in every library.

PHYSICIAN'S VISITING LIST (LINDSAY AND BLAKISTON'S) FOR 1914. Sixty-third year of its publication. Philadelphia: P. Blakiston's Son & Co., $1.25 to $2.50.

This well-known visiting list appears in different sizes which allow for practices of from twenty-five to one hundred patients weekly. Its structural materials are of the best. It contains the usual data for bedside reference, including tables of dosage, weights and measures, incompatibility, poisoning and other accidents, and pages for addresses and various memoranda.

THE MEDICAL RECORD VISITING LIST AND PHYSICIAN'S DIARY FOR 1914. This very popular and most compact list is supplied for thirty or sixty patients weekly, dated or undated, and for ninety patients weekly, dated. It is bound in red or black morocco, or may be had in calf or seal if desired. Prices range from $1.25 to $4.00. Published by William Wood & Company, New York.

The use of a list like this is a great economiser of trouble and time and will directly save many accounts by enforcing business-like methods in recording and presenting the same.

Besides the usual "front matter" it contains visiting list with special memoranda, records of obstetric engagements and practice, records of vaccinations, register of deaths, addresses and cash account.

ITEM

CLINICS, DEPARTMENT OF PUBLIC CHARITIES

December, 1913.

Randall's Island Hospital.—Orthopedic Surgery, Dr. Ogilvy, Tuesdays, 10:00 A. M.

Cumberland St. Hospital.—Gynecology, Dr. Burnham, Tuesdays, 1:00 P. M.

City Hospital.—Obstetrics, Dr. Dorman, Wednesdays, 2:30 P. M.

Kings County Hospital.—Orthopedics, Dr. Truslow, Wednesdays, 10:00 A. M.

Kings County Hospital.—Orthopedics, Dr. Napier, Wednesdays, 4:00 P. M.

Coney Island Hospital.—Pediatrics, Drs. Beck and McQuillan, Wednesdays, 3:00 P. M.

Coney Island Hospital.—Pediatrics, Drs. Pendleton and Van Wart. Wednesdays, 3:00 P. M.

City Hospital.—Gynecology, Dr. Child, Thursdays, 2:00 P. M.

Metropolitan Hospital (Dec. 18).—Obstetrics, Dr. Storer, Thursdays, 2:30 P. M.

Metropolitan Hospital (Dec. 18).—Pediatrics, Dr. Wallin, Thursdays, 2:30 P. M.

Cumberland St. Hospital.—Gynecology, Dr.Burnham, Thursdays, 1:30 P. M.

Kings County Hospital.—Obstetrics, Dr. Judd, Thursdays, 10:00 A. M.

Coney Island Hospital.—Gynecology, Drs. MacEvitt and Mills, Thursdays, 1:30 P. M.

Coney Island Hospital.—Gynecology, Drs. Mayne and Rankin, Thursdays, 1:30 P. M.

Kings County Hospital.—Pediatrics, Dr. Parrish, Saturdays, 3:30 P. M.

All registered physicians, visiting and resident, and medical students, are cordially invited to attend these clinics. Cards of admission may be obtained at the Academy of Medicine, 17 West 43d street, Manhattan, and at the Medical Society of the County of Kings, 1313 Bedford Avenue, Brooklyn, as well as from the secretaries of the several medical colleges.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Action of So-called Emmenagogue Oils on Isolated Uterus.—D. I. Macht (*Jour. A. M. A.*, 1913, lxi, 105) has tested the actions of the following oils on the horns of a cat's uterus, pregnant and nonpregnant: oleum hedeomæ (pennyroyal), oleum sabinæ (savine), oleum tanaceti (tansy), oleum rutæ (rue), oleum thymi (thyme), oleum terebenthinæ (turpentine) and apiol. All of these substances, even in small quantities, have absolutely no stimulating action on the uterus. On the contrary, they cause its relaxation and even paralysis. Pennyroyal, tansy, and apiol seem to be the most toxic of the group examined. The least deleterious of the group was turpentine. The action of these oils as abortifacients, if they act as such, is no different from that of any other powerful systemic poison, such as phosphorus or arsenic. They have very little if any therapeutic value, and do not deserve the place among the official pharmacologic preparations which many of them hold.

Ruptured Uterus.—C. H. Davis (*Surg., Gyn.* and *Obst.*, 1913, xvii, 51) reviews the literature since 1846 and records four cases of rupture of the pregnant uterus. He says that rupture of the uterus is probably a more frequent complication of pregnancy than is indicated by the statistics of the earlier writers. The difference between complete and incomplete rupture is one of degree. It is probable that most ruptures are at first incomplete. As complete rupture increases the shock and danger from all hemorrhage and sepsis, it is the more dangerous complication. The rupture involves the lower uterine segment and cervix in at least 53.8 per cent. of cases, the rent being more often on the left side and frequently involving the uterine artery. Certain ruptures may be prevented by close observation of the case during pregnancy and by "good obstetrics." A considerable number of ruptures follow Cesarean section. A woman who has had a Cesarean section should be confined in a hospital in subsequent pregnancies, preferably by a section shortly before term, as we cannot know the condition of the scar area. Tamponade and binder is a good temporary measure and may give good results in the incomplete cases where there is little hemorrhage, but in all classes of cases operative treatment gives better results than conservative and should be employed whenever possible.

Pituitary Extract in Obstetrical Practice.—B. P. Watson (*Can. Med. Assoc. Jour.*, 1913, iii, 739) states that pituitary extracts have a powerful effect in inducing and in strengthening uterine contractions. The type of contractions induced is similar to that which occurs normally, although at first there may be a tendency to prolongation of the pains. Such prolonged contractions result in slowing of the fetal heart, but the child is seldom in danger. When given in the late part of the first and in the second stage of full time labor the polarity of the uterine contractions is not interfered with, but in early abortions and early in the first stage a simultaneous spasm of the os may occur. Its chief field of usefulness is in the first and second stages of labor, when there is delay due to feebleness of the pains, alone or when combined with other complications, such as malpositions of head, malpresentations, multiple pregnancy, slight narrowing of the pelvis, etc. In the induction of abortion, in the treatment of abortion already in progress, and in incomplete abortion, its action is so uncertain that it is not to be recommended, except in cases where the os is widely dilated. In the induction of premature labor its effects are uncertain, but if sufficient dosage be given they may be good. In the induction of labor at full term and after better results are obtained than in premature cases. It gives good results in many cases of postpartum hemorrhage, but is not superior to the various preparations of ergot. It has the power of sensitizing the uterus, so as to allow these preparations to act more powerfully, the combination being most effective. It is a useful adjunct in the treatment of placenta previa, used in conjunction with rupture of the membranes, the use of hydrostatic dilators, or turning.

Intrauterine Fracture.—R. R. Smith (*Surg., Gyn. and Obst.*, 1913, xvii, 346) divides intrauterine fracture into several different groups. First, those which take place during delivery—intrapartum fractures. The head is the most common point of injury, although fractures of the femur, the humerus and clavicle are not infrequently met with. Most of these fractures but not all take place during artificial delivery. In a second group we may place those fractures which have as a predisposing cause certain diseases of the bone. Another and more interesting group because of its former classification as intrauterine fractures, is that presenting certain bone deficiencies with deformity. The fourth group, in which a case recorded by the author should be included, is that of true intrauterine fracture, those in which the fracture of one or more bones of the fetus has taken place previous to labor. A careful search of the literature shows forty-four such cases, including that of the writer. In three cases it has been produced by penetrating agents. In twenty-two instances the fracture was caused by falls, in ten by blows, and in one by pressure, often without material injury to the mother. The injury seldom interrupted the pregnancy—twenty-nine went on to term, eight did not, and in seven the result is not given. Most of the fractures were single (thirty-two cases). In five, however, they were multiple. The clavicle was the bone most frequently fractured.

Treatment of Puerperal Sepsis by Intravenous Injections of Distilled Water.—Ilkewitsch (*Zentralbl. f. Gyn.*, 1913, No. 38) presents a preliminary communication based on experiments made in the Municipal Hospital at Moscow. The author had employed injections of a 1 per cent. nitrate of silver solution in quantities of 500 c.c. in a series of 138 cases of puerperal sepsis with good results and then found that identical results were obtained with even more dilute solutions of silver and came to the conclusion that the distilled water was probably the active agent in the treatment. After making experiments in animals, he employed the method in 142 cases including pyemias, septicemias and septicopyemias. The blood changes noted in these cases may be divided into three classes: A. The number of the white and red cells increased but the hemaglobin content remained unchanged. B. The number of the white cells increased, that of the red diminished and likewise the hemaglobin content. C. A diminution occurred in the number of the red and white cells as well as the hemaglobin content. Morphological changes were not observed in any case. Those cases in which the red cells increased in number are usually cured even when the number of white cells are diminished. Where there is steady decrease in the red cells, a fatal issue is common. In the presence of a localized focus, only operative interference is of value. The clinical picture in the average case is as follows: In from one to one and one-half hours after the chill, the temperature rises rapidly and then subsides, accompanied by marked perspiration. In isolated cases, the chill with subsequent rise of temperature does not occur. An improvement results even in those cases where the red cell count is reduced to 1,500,000, which was not observed where the nitrate of silver solution was used. Further details are reserved for a subsequent publication.

Oxygen in the Treatment of Eclampsia.—Schwab (*Zentralbl. f. Gyn.*, June 7, 1913) suggests the administration of oxygen in severe eclampsia through a rubber catheter introduced into the trachea through a tube down to its bifurcation. He bases his suggestion on the observation that intoxication with carbonic acid gas is one of the principal dangers in eclampsia and that the undisturbed and permanent access of oxygen to the respiratory passages through the tracheotomy tube is more efficacious than the mechanical artificial respirations so often employed.

The Induction of Premature Labor in Contracted Pelvis.—Ponfick (*Ztschr. f. Geburtsh. u. Gynäk.*, Bd. lxxiii, Hf. 2) refers to a series of 21,000 labors in which there were forty-two cases of narrow pelves, in fifteen of which labor was prematurely induced. The writer is inclined to favor this method of treatment in preference to the operative procedures, especially where the diagonal conjugate is not less than 9 centimeters. His recommendations are as follows: Labor is not to be induced before the thirty-sixth week and is best initiated by the dilating bags. Rupture of the membranes is only to be employed in cases of polyhydramnios. During the introduction of the bags, the fetal heart is to be carefully watched and care taken not to compress the umbilical cord. A balloon of 500 to 600 cubic centimeters capacity may be employed, which corresponds to the circumference of a head of from 30 to 32 centimeters. After the rubber bag has been expelled and the membranes are still intact, external version may be employed or if the head readily follows, this may be permitted to take part normally in the mechanism. Where the membranes are ruptured the external version, if done, must be carefully carried out to avoid prolapse of the cord or the small parts. If this does occur, internal version is necessary. The child must be cared for in the usual manner. Of the eighteen cases thus confined, nine were dismissed from the hospital with living children and a rise of temperature in only two of the mothers. Of the six cases in which the children died, the fatal result could be attributed usually to the version. The author regards the procedure as practically harmless for the mother and notwithstanding the fetal mortality, believes that it is the only justifiable procedure in such cases.

GYNECOLOGY AND ABDOMINAL SURVEY.

Pelvic Disorders in Relation to Neurasthenia.—C. Oldfield (*Practitioner*, Sept., 1913) says that pelvic disorders have no specific action in causing neurasthenia. Pelvic complaints, with the exception of disorders of menstruation, are as often as not unassociated with physical signs, and due to a general neurasthenia. Certain conditions, such as slight exposure of vaginal wall, cervical erosion, laceration, retroflexion of uterus, prolapsed ovary, ovaritis, and cystic ovary do not produce symptoms, and do not require treatment. Chronic pelvic inflammation, calling for operative treatment, sometimes exists apart from recognizable tumor formation. Greater care is necessary, before, during, and especially after operation, in order to prevent postoperative neurasthenia. Before operating on neurasthenics with gross disease, and before operating on cases without demonstrable physical signs, the surgeon should seek the advice of the physician.

Anatomical Findings in Carcinoma Cases Treated with X-rays and Mesothorium.—Haendly (*Arch. f. Gynäk.*, vol. c, Hf. 1, 1913) presents an extended report on five cases from Bumm's Clinic in which the specimens were obtained by operation or autopsy and studied with particular reference to the penetrating powers of these therapeutic agents. Haendly claims to have demonstrated that carcinomatous tissue is undoubtedly made to disappear by treatment with mesothorium and *x*-rays. In the outer layers in which necrosis results, no carcinomatous tissue is found, whereas well-marked changes are not only present in the carcinomatous cells of the deeper layers but also in the other tissue elements, The effect however is not uniform as living masses of cells are found alongside of nodules at the surface as well as deeper down, which have undergone degeneration even in those cases where the treatment had been employed for a considerable length of time but which subsequently came to autopsy. Small nests of cells were also found in the wall of the uterus. It would appear therefore that the penetrating effect of these rays as hitherto employed is neither uniform nor sufficient although the clinical results recently obtained seem to show that by efficient filtration screens an increased activity of these rays may be obtained without damage to the healthy tissue.

Congenital Chondrodystrophy.—Wagner (*Arch. f. Gynäk.*, vol. c, Hf. 1, 1913) publishes a very complete report on a case of this kind in which a direct inheritance from mother to child could be demonstrated. The mother was under clinical observation since her tenth year and presented well-marked clinical evidences of chondrodystrophy including excessive muscular development, regular dentition in contrast to rickets, characteristic brachycephalic shape of the head, short extremities without bowing and enlargement of the hypophysis with normal or prematurely ossified centers, short thick diaphysis and a normal length of the trunk. The pelvis was that of the type described by Breus and Kolisko. The disease is generally transmitted to the father, although in this instance the mother was affected. The author believes that the condition is due to two causes, either we are dealing with an inhibition of the normal bone formation as the result of disturbances in the endocranial glands, especially the primitive genital glands, or a muscular interference of the growth of the long bones results from excessive muscular effort which is brought about by hypertrophied development of the musculature as the result of a hyperfunction of the genital glands.

Ovulation, Corpus Luteum and Menstruation.—Ruge (*Arch. f. Gynäk.*, vol. c, Hf. 1, 1913) reports his observations in a series of 106 cases in which the uterus and adnexa were removed. He finds that ovulation and the formation of the corpus luteum stand in a well-marked close association with the cyclic changes in the uterine mucosa. The rupture of a follicle and the beginning of the development of the corpus luteum take place during the first fourteen days counting from the beginning of menstruation. The stage of vascularization is combined with the premenstrual changes in the uterine mucosa. The full development of the corpus luteum extends to the beginning of menstruation. The retrogressive changes in the same usually start with the beginning of menstruation and are closely connected with the interval stage to the mucous membrane of the uterus. Full development of the corpus luteum and freshly ruptured follicles were not observed in any case and one apparently excludes the other.

The Danger of Combining Morphine with General Narcotics and Hypnotics.—Straub. (*Münch. med Wochenschr.*, August 19, 1913) in referring to the common employment of morphine before general narcosis, calls attention to certain danger in this procedure. In a case where chloroform was given after a preliminary injection of morphine for a minor operation, death resulted from respiratory paralysis, although the general narcosis was not a deep one. By means of experiments in rabbits it was shown that the slowing of the respiration remained for several hours after the injection and if a general narcotic or hypnotic had been administered, this rate was further diminished.

DEPARTMENT OF PEDIATRICS.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON PEDIATRICS.

Meeting, of October 17, 1913.
HENRY D. CHAPIN, M. D., *in the Chair.*

ATYPICAL INFANTILE PARALYSIS.

DR. F. L. WACHENHEIM.—One of the striking features of the present epidemic of infantile paralysis, which has prevailed since 1907, is the large proportion of atypical cases. The typical and classical form runs the following course: The patient suddenly falls ill with moderately high fever, more or less marked gastrointestinal disturbance, and general weakness of the extremities; in a few days the fever abates, leaving the child paralyzed in one or more limbs. This paralysis gradually passes off, except for one group of muscles, in usually one of the lower extremities, which remains atrophied and disabled for life.

Cerebrospin alaffections, such as the polioencephalitis of Wernicke and the polioencephalitis of Strümpsell, were formerly rare and very imperfectly understood; infantile paralysis was considered a disease of the anterior horns, usually of the lower spinal cord, rarely involving other portions of the gray matter, though the conditions above referred to were regarded as possible variations from the type described.

During the epidemic of last Fall I observed in all seven cases, of which only one was typical. The other six were so atypical as to be worth reporting in detail.

CASE I.—This case was seen by me in consultation with Dr. Koronefsky. The child had been sick for several days with a temperature up to 106° F.; flaccid posture of the left arm indicated paralysis of the left deltoid muscle; otherwise there was a general muscular weakness. The prognosis seemed doubtful as to life and poor as to restitution of the impaired muscle, yet the child made a rapid and complete recovery, save for a slight weakness in the left leg.

CASE II.—This child had had a slight fever with gastrointestinal symptoms for some days but the temperature had fallen to normal. During the last few hours before I saw the child there had been a growing stupor and the child was practically comatose. The reflexes were almost absent in the lower extremities, but otherwise nothing precise could be elicited. In view of the presence of a local epidemic infantile paralysis was diagnosticated. In a few days the child's mental condition became normal, but one deltoid muscle showed paralysis. This case was a fitting introduction to the four others, all of which presented cerebral symptoms. Patients suffering from the cervical form of poliomyelitis were especially subject to involvement of the gray matter of the medulla oblongata and basal ganglia and possibly also of the convexity. The deep somnolence was a characteristic and alarming feature of this group. Many authors insist that the cerebral affections associated with poliomyelitis do not affect the cortex, but only the basal ganglia, while others, including Clark, who has reported an illustrative case, do not accept this restriction. The whole matter is far from a final decision but the frequent grave disturbances of the sensorium are strong evidence in favor of Clark's view.

The following cases were observed in the wards of the Sydenham Hospital:

Case. III.—This patient was a child seventeen months of age, whose previous history had no significance. His illness began October 15, when the parents noticed that the child's head fell backward, his face flushed, and a little later both arms hung limp. The patient vomited once but had no convulsions. Both eyes were staring and turned upward. When first admitted to the hospital the child was in a comatose condition, moving its legs and forearms freely, but not the neck and shoulders. The pupils reacted to light, and there was no strabismus noted. A slight facial paresis was apparent. The muscles of the shoulder girdle and neck were completely paralyzed; the other muscle groups were slightly, if at all, affected. In the course of a few days the stupor cleared up and the child began to smile, but a slight facial paresis was observed. On October 23 there appeared an intense sweating, limited to the face, with a normal body temperature. This phenomenon persisted for a number of days in a diminishing degree. Early in November there appeared a slight improvement in the deltoid muscles and electrical tests at the time showed reaction to faradism in the shoulder group and the sternomastoids. This condition remained without change until November 14, when the patient was discharged from the hospital. This case was clearly one involving the uppermost portion of the cervical cord, with special implication of the origins of the spinal portion of the spinal accessory nerve, in itself a rare type. A search of literature had revealed to him no similar instance of localized facial sweating, though many authors have mentioned profuse general perspiration. General hyperidrosis in infantile paralysis might very well be attributed to a disturbance of the sweating center in the medulla oblongata and is, therefor, especially likely to occur in cases of the cervical and cerebral types. In the case under consideration it was more reasonable to bring this local sweating into relation with the slight facial paresis, which was present in the early stages of the disease, though the connection is not as clear as one might wish.

The involvement of the sensorium was unusually marked in this case and I suspect that the medulla oblongata was actually slightly involved. In view of electrical tests, it is extremely doubtful if the trapezii will recover sufficiently to enable them to support the head unaided. The difficulties of a neurological operation in this case are decidedly greater than in those cases affecting the extremities.

CASE IV.—This patient, aged thirteen months, was admitted to the hospital on October 16. The present illness began October 11, when the mother noticed that the child was feverish and the mouth was drawn to one side. On admission to the hospital the child rolled its head from side to side, the right side of the face was flushed and flattened out, and there was paresis of all the extremities. The pupils were uneven, and reacted to light feebly. The mental condition was slightly stuporous, there was slight Babinski, but knee jerks were not absent. The patient was unable to close the right eye. Up to October 29 there was slight fever; the extremities gradually returned to normal, though the deltoids remained paretic for some time. The persistent lagophthalmos resulted in a purulent conjunctivitis. As the child's mentality cleared up the paralysis of the right facial nerve became the conspicuous feature of the case. The condition of the facial nerve remained stationary up to the day of discharge, November 9. This case was a typical one of polioencephalomyelitis, with the main lesion in the pons. It presented no features calling for special comment, except the site of the inflammatory process which we have learned no longer to regard as a great rarity.

CASE V.—This patient was two years of age and had been sick two weeks when admitted to the hospital on October 29, 1912. His illness began with the usual symptoms and as the disease advanced the mother noticed weakness of all the extremities, staring of the eyes, inability to raise the head, profuse sweating, and a red rash on the face. On admission the patient presented complete paralysis of both legs and of the upper arms, paresis of the neck and hands, eczematous eruption on the face and body, pupils reacting sluggishly, absence of patellar reflexes, temperature ranging from 100 to 102° and pulse from 130 to 160. During the following four weeks the paralysis gradually passed off, except in the legs and right deltoid, the eruption spread over a great portion of the trunk, and there were copious sweats, not limited to the face but most marked there. Electrical tests made on December 9 showed feeble reaction to faradism in the right deltoid and left peroneus group, almost total reaction of degeneration in the right peroneus group of muscles; the remainder of the muscular apparatus seemed normal. About December 20 the temperature fell to normal and the patient was discharged on the 24th. About a week later the child was readmitted with symptoms of bronchopneumonia, and marked cardiac weakness, and succumbed to an attack of acute dilatation of the heart a few days later. Prolonged subfebrile temperatures with tachycardia were not uncommon in poliomyelitis, but a duration of seven weeks was unusual and should lead to a careful search for some other cause. The profuse perspiration might have been due to the poliomyelitis or to cardiac weakness, but the relative share of these two affections seems to me indeterminable. There was no doubt but that in this case the involvement of the gray matter was unusually extensive; it is therefore not impossible that his patient suffered from grave impairment of the cardiac innervation. It is well known that a fatal paralysis of the diaphragm, caused by a lesion in the center supplying the phrenic nerve, was not excessively rare in poliomyelitis. It is among the possibilities that the present case may be assignable to this group.

Case VI.—This patient was an infant nine months of age, admitted to the hospital October 17, 1912. For a week previously it had been suffering from fever, vomiting, gradually developing rigidity of the neck, later general muscular rigidity and loss in weight. On admission the patient lay in extreme gun-hammer attitude, with tonic spasms of all muscles, fontanel not bulging markedly, pupils equal, pulse 114, temperature 103, marked Kernig, increased patellar reflexes. A lumbar puncture yielded turbid fluid under pressure, the sediment consisting chiefly of lymphocytes and no meningococci. An examination of the ears showed some retraction of the drum membranes, but no evidence of acute otitis or perforation. In a few days the temperature became normal but the general condition remained unchanged, the weight of the child, very curiously, remained quite stationary. On the 23 a clear spinal fluid was obtained, which developed a fibrin clot on standing, did not reduce Fehling's solution and proved sterile when cultivated: at this time it was noted that the fontanel was becoming depressed. A few days later the spastic condition began to improve rapidly. The child soon began to crawl about but seemed amaurotic and a rapid gain in weight set in. The disease has left a residuum of mental impairment and blindness. Early in November an examination of the eyes showed an intense papillitis. Treatment consisted essentially in the administration of hexamethylenamin. At the beginning antimeningococcus serum was injected, until the bacteriological examination and the character of the cerebrospinal fluid excluded the diagnosis of epidemic meningitis.

The inclusion of this case, apparently one of meningitis, in this group rested on the following points of differential diagnosis. Cerebrospinal meningitis was excluded because of the preponderance of lymphocytes in the cerebrospinal fluid, the absence of meningococci, the rapid recovery from the uncommonly severe posterior basic symptoms, and the absence of an epidemic at the time. Tuberculous meningitis was excluded by the high leukocyte count, the acute onset, the favorable outcome, and the negative v. Pirquet reaction. The other forms of meningitis, such as are caused by the streptococcus, the pneumococcus, or the influenza bacillus, would show the respective germs, and also end fatally; one was therefore safe in excluding them also. On the other hand, it is shown by all extant postmortem records that poliomyelitis is always accompanied by a more or less severe meningitis. While this is usually of a mild type, it might be sufficiently intense to cause characteristic symptoms for a number of days or weeks, and even occasionally to be responsible for a fatal termination. I wish to call attention to the series of cases reported by Koplik in which symptoms recalling both cerebrospinal and tuberculous meningitis dominated the clinical picture throughout the course of the disease. While I cannot find records of another case presenting optic neuritis terminating in atrophy and amaurosis, such an untoward event is readily conceivable. It seems that the Fehling test is of doubtful value in severe cases of meningoencephalitis, seeming to vary according to the intensity of the infection, rather than the etiology of the disease. A characteristic feature of these cases is the acute onset, differing in this respect from tuberculous meningitis, but resembling the meningococcus type. The high leukocyte blood-count also seemed to be a constant feature, differing from the findings in ordinary poliomyelitis. The cerebrospinal fluid at first is cloudy, but differs from that of cerebrospinal meningitis in that the sediment consists chiefly of leukocytes; in a few days the fluid clears up, leaving only a delicate fibrin on standing. The germ of poliomyelitis which has only just been found may turn up in the spinal fluid of this group. The intraspinal pressure is usually not high, far lower than in the usual forms of meningitis. The temperature is apt to run the course usually observed in poliomyelitis, possibly rather high at first, but falling to normal before the remission of the grave cerebral symptoms. After all is said, the most striking feature is the disproportion between the cerebral symptoms and the general condition of the patient; this is the chief guide to the real diagnosis in my case. After the first few days the infant held its own and even gained in weight, in spite of the presence of an apparently serious intracranial condition. This clinical discrepancy is so remarkable that it cannot fail to attract the notice of the attending physician, and clear up speedily all remaining doubts as to the type of the disease. The prognosis in this type of the disease is fairly good as to life, still unfortunate after-effects, as paralysis of some muscular group, mental impairment, and amaurosis may remain. The resulting paralyses are apt to be of the flaccid type distinctive of poliomyelitis, not spastic as after ordinary meningitis. The remarkable variations displayed by so small a clinical material are sufficient to convince us that infantile paralysis is one of the most protean affections of the central nervous system.

THE YEAR'S PROGRESS IN POLIOMYELITIS RESEARCH.

Dr. George Draper.—I did not write a paper because the subject given me calls for a review of the literature on the subject of poliomyelitis. Consequently anything I may say has already been published and presented in a better way than I can give it. However, I will mnetion three points which are worthy of special emphasis. The first is in reference to the visceral pathology of the disease. Poliomyelitis has hitherto been classified as a disease of the nervous system, but now it has been discovered that there are general lesions.

The lesions of the liver similar to those noted in leukemia are specially worthy of mention.

The second point in regard to the progress of our knowledge of this disease has reference to its epidemiology. In Sweden washings from the rectum of patients suffering from poliomyelitis have been injected into monkeys and the disease has been reproduced, though it did not follow the typical course pursued in man. It has been found that the virus exists in the nose and mouth of healthy persons who have been thrown in contact with the disease. Thus these secretions long suspected as being the carriers of poliomyelitis have proved to be such.

The third and what seems to be the discovery of the greatest importance is the identification of the organism itself. This organism is extremely small, just on the limits of visibility, is anaerobic, and cultivated only with the greatest difficulty. It takes the Giemsa stain best, is variable to the Gram stain, but tends to be Gram positive, varying, however, with the constituents of the media. It fulfills Koch's laws. The discovery of this organism is not only of moment because of its relation to poliomyelitis but because it opens up a new field of bacteriology.

DISCUSSION.

Dr. Henry Heiman.—I have been greatly interested in the papers. When one considers that there are at least nine varieties of poliomyelitis it is not surprising that so many atypical cases are found. Dr. Wachenheim's cases would serve as a nucleus for many other types likely to be observed in the future. Hardly any part of the cerebrospinal system is exempt from attack, and this may account for the many types of this disease. Because of the presence of spasticity the cerebrospinal and meningeal types are sometimes confused with meningitis. After the subsidence of the spastic signs paralysis appears and the diagnosis becomes clear. In the severe cerebral forms it is almost impossible to give a definite prognosis.

I would like to ask, since the germ is anaerobic, how it is able to live in the nasal secretions or in the rectum.

Dr. H. L. Amoss.—Dr. Draper has described the organism of poliomyelitis very accurately and has said about all that is to be said on the subject at this time. It was only with the greatest difficulty that we succeeded in cultivating the organism at all according to Noguchi's method. We tried out about twenty-five samples of ascitic fluid before we at last succeeded in cultivating the organism from the nervous tissues of a monkey dead of the disease. The organism has been found once in the spinal fluid of a monkey but never, as far as I know, in that of a human being. We have concentrated spinal fluids from several human cases of acute poliomyelitis under diminished pressure at 33° C. and injected it into the brain of monkeys, resulting in suggestive symptoms only.

Concerning the viability of the virus I may say that one of our strains has been kept in 50 per cent. sterile glycerin in the ice-box for twenty-four months and is still capable of producing the disease when inoculated into the brain of monkeys.

Dr. George Draper, in closing the discussion, said that they had not been able as yet to reproduce the disease with the blood of those affected with poliomyelitis. Perhaps changes going on in the blood modified the organism, and possibly the secretions of the nose and throat formed a capsule enclosing the organism and excluding the air and thus preserved the vitality of the organism.

Dr. F. L. Wachenheim.—The points which I wish to emphasize in closing the discussion are the difficulty of diagnosis in the meningeal cases in the early stages, and that in a few days one can size up these cases as not typical meningitis. The subject of insects as carriers of poliomyelitis has not been discussed this evening and it is to be hoped that it will be brought up later.

RESULTS OF THE INVESTIGATIONS OF SUMMER DIARRHEA AT THE BOSTON FLOATING HOSPITAL.

Dr. Henry I. Bowditch, Boston.—Greater interest is shown in Boston than in most other cities in the bacteriology of summer intestinal diseases of infancy. My remarks will be only an accumulation of the results of the investigation in the Boston Floating Hospital from 1910 to 1913. These facts illustrate the advantages of intensive work.

The Boston Floating Hospital is a small hospital having accommodations for 120 ward and 160 day patients. The children admitted are from one day old to seven years. There is a postgraduate staff of eighty nurses, sixteen internes, two bacteriologists, and one pathologist connected with the hospital. The first object of this hospital ship is for the service that it gives the public; in addition it has attempted to produce scientific results which will be helpful to humanity.

The scientific work was started in 1907 when Dr. William P. Lucas with others studied agglutinins in the blood of dysenteric cases.

In 1910, Dr. Arthur I. Kendall was appointed as first bacteriologist and made, with the staff, an extensive bacterio-clinical study of diarrhea, especially dysenteries. We established a shorter method by twenty-four hours of making the bacteriological diagnosis of the dysenteries produced by the Flexner and Shiga bacilli. We found the gas bacillus was in many cases the predominating organism and then demonstrated a short clinical test for the presence of this bacillus in the stools. This test consisted in taking a tube one-quarter full of milk and inoculating it with mucus from a movement. The whole was boiled for one minute over a Bunsen flame and then kept at blood heat for from six to nine hours. A positive gas bacillus infection peptonizes the milk, squeezes out the whey, riddles the curd with gas, and produces a strong odor of butyric acid.

This same year we shortened the former long period of starvation in dysenteries from three, five, or seven days to twenty-four hours. Boiled water was given as temporary starvation. This was followed by barley water, lactose or buttermilk, according to the infection. We used for the first time this year (1910) a solution of dextrose (2 1/2 per cent. in normal saline) for stimulation in cases of dysentery of the Flexner type with marked loss of water and depletion. It was usually injected in rather large amounts at first, 4, 6, and 8 ounces every twelve hours. The idea underlying this procedure was the following: The normal amount of circulating dextrose in the system had been partially used up, and by supplying the infecting organism with this food it could be prevented from living on the body proteins and producing toxins.

In 1911 we continued this same study. In this year we isolated for the first time the Shiga bacillus from the blood. We made an investigation this year along the line of rectal irrigations, trying various solutions; most of them did little good. We now give saline irrigations immediately on admission and but few during the course of the disease. We used silver nitrate (3 per cent.) in instances where the infection was low. Other solutions like tannic acid had little effect. We found pyelitis was rather frequent in our cases, the majority occurring in cases of streptococcus infection.

The following year, 1912, there was an increase in the number of cases infected with the gas bacillus. We followed out the theory of feeding high proteids, giving buttermilk, fat-free milk, and albumin milk without any trouble. After the first week we felt perfectly safe in giving these without making a bacteriological examination. Almost all the children improved under this treatment. Any one of these varieties of milk seemed to agree as well as another. We thus concluded that milks with high percentage of protein were better for gas bacilli infections. We also found that in this kind of infection it was dangerous to give lactose. With the administration of lactose and the reappearance of other symptoms one should immediately change to high protein feeding.

The year 1913 is as yet an incomplete story, but it is interesting as far as it goes. The bacterial findings are now more accurate than formerly. During this year there was a predominance of the slime bacillus; this bacillus first appeared in August 1912. The bacterial study of these cases during these years seems to show that the predominating bacillus in the month of August will be the predominating one in the following July. This carries out the cyclic phenomenon of epidemic diseases. We used this year high protein feedings during July because of the presence of the gas bacillus. In August the Flexner bacillus appeared, and because of the danger of giving high proteins in such cases we quickly changed to other methods of feeding, giving 5 to 7 per cent. lactose solutions with or without barley starch.

Cases on the Floating Hospital are at the service of any of the visiting staff. The physicians drawn from the various hospitals cooperate completely and help one another. We hold a yearly clinical mid-summer meeting in order to go on with the season's work. This meeting proves most beneficial and to it all are invited who may be interested.

DISCUSSION.

Dr. Richard M. Smith, Boston.—I wish to thank you for the opportunity to come to New York to discuss this paper. As Dr. Bowditch has said, we have paid special attention on the Floating Hospital to the acute diseases of the gastrointestinal tract and have tried to separate the cases into groups. We have used the classification recommended by the Pediatric Department at the Harvard Medical School and have found it a satisfactory working basis. It has served the very useful purpose of making it possible for us to understand definitely what type of condition we mean by the different names given.

We have seen, primarily, three large groups of patients on the Floating Hospital, the first presenting simple digestive disturbances caused by errors in diet, due either to a single constituent of the food or a combination. The diseases in this group are not primarily associated with the summer months and we have studied them less intensively than the other groups. The second group includes patients who have more than a simple digestive disturbance. The etiology of this group is not well understood. Apparently it is not primarily due to bacterial action, though the bacteria may enter into the condition, and is not exclusively dependent on atmospheric conditions. There is a small group of cases within this general division which are certainly due to great atmospheric humidity. Whether it will be found on further study that the weather conditions have more to do with the etiology of the whole group than at present supposed, I am unable to say, but I am inclined to believe that such will be the case. We have studied these cases very carefully, especially in relation to the third group.

The last group includes cases which are true infections and are to be sharply differentiated from the other groups. The organisms responsible for the individual cases vary, but the cases as a whole can be satisfactorily grouped together under the term infectious diarrhea. The type of organism shows a marked seasonal tendency, one type usually predominating in a single summer. The particular organism cannot be absolutely determined by clinical study alone but must be determined by bacteriological investigation. The pathological findings from different bacteria vary strikingly, as does also the response of individual infants to various kinds of treatment, whether fed upon carbohydrate or proteid high diet. Many of the types of organisms and the corresponding clinical condition are only partially understood, but we recognize several distinct groups, the Shiga, Flexner bacilli and the gas bacillus.

Further investigation is necessary along the lines outlined by Dr. Bowditch in order that we may reduce the undetermined organism to a minimum. We have undertaken our work with no preconceived ideas, but we are trying to draw logical conclusions from the combined clinical, pathological and bacteriological study of the material as it has presented itself in the Floating Hospital.

DR. ROWLAND G. FREEMAN.—I have been interested in Dr. Bowditch's paper, and if he can teach us some simple way of identifying the different sorts of bowel infections and a successful treatment for each sort we will be infinitely indebted to him. My first experience in pediatrics having been in the autopsy room I have always used, myself, an anatomical classification. Clinical cases are readily classified in this manner. The lesion is in most cases an ileocolitis, only the lower 12 inches of the ileum and each end of the colon being infected, the transverse colon being distended with gas. These cases may be acute or chronic. There may be simply a congestion or an enlargement of the follicles, or an erosion giving rise to blood in the stools. I have always looked forward to a bacteriological classification but so far our information has not been sufficient for this. I have been interested in the mention of the Flexner bacillus. Some years ago, stimulated by Dr. Flexner, great efforts were made to isolate this bacillus from the stools in hospitals in various cities, this organism then being known as the Shiga bacillus. I had two large services that summer in institutions, and in studying the results of the bacteriological examinations I felt convinced that the Flexner bacillus was simply a terminal infection and had no significance as regards prognosis and treatment. We were not, however, looking for the Flexner bacillus as a predominating organism.

DR. GODFREY R. PISEK.—The practical bearing in this work presented by Dr. Bowditch, based on a study of a large number of cases studied from day to day and week to week and finally compared to previous years, is that of establishing a specific bacteriologic etiology in some of our cases of diarrhea. It would have been impossible without the combined work of the clinician, the laboratorian and the chemist. They have told us, for example, that albumin milk is indicated in cases due to the gas bacillus and thus a bacteriological examination shows the therapeutic indication. The southerner, who comes to our schools to study, asks more questions regarding the bacteriology of diarrheal diseases than any other student. He is interested in this phase because he has large opportunities for observing certain types of diarrhea that react differently to the same therapeutic measures. In other words, he gets good results in some cases and not in others. The Boston men are on the right track in their investigation and we must also conclude that certain types of bacilli are apt to predominate in some localities. Dr. Bowditch has told us nothing of their mortality in Boston. We in New York City are rather proud of our statistics, and I beg to present a brief summary bearing on the city's infant mortality. It is well known that in New York we have had, cooperating with the Board of Health, sociological agencies, and an effective educational propaganda including rational methods of medical management; these have effected marked results as follows:

MORTALITY UNDER ONE YEAR OF AGE, 1906–1912.

City of New York.

	1906	1907	1908	1909	1910	1911	1912
Total deaths under one year for the year.	17,188	17,437	16,231	15,976	16,215	15,017	14,289
Births for the year.........	111,772	120,720	126,862	122,975	129,080	134,477	135,666
Infant deaths per 1000 births..	153.7	144.4	127.9	129.9	125.6	111.6	105.3

TABLE SHOWING MORTALITY UNDER ONE YEAR IN NEW YORK CITY OCCURRING DURING THREE SUMMER MONTHS.

	1908	1909	1910	1911	1912	1913
Actual................	5739	5154	5574	4593	4370	4119
Percentage of year.....	35.3	32.2	34.3	30.5	30.6	

TABLE SHOWING DIFFERENCE BETWEEN MORTALITY UNDER ONE YEAR IN THREE SUMMER MONTHS OF 1913 AND CERTAIN OTHER YEARS.

	From 1908	From 1909	From 1910	From 1911	From 1912
Actual...........	−1620	−1035	−1455	−474	−251
Percentage.........	−28.2	−20.1	−26.1	−10.3	−5.7

TABLE SHOWING COMPARATIVE FIGURES FOR NEW YORK CITY FOR THE FIRST NINE MONTHS 1912 AND 1913.

	Births		Stillbirths		Deaths					
					Under 1 mo.		Under 1 yr.		All ages	
	1912	1913	1912	1913	1912	1913	1912	1913	1912	1913
Total........	101,093	101,469	4,965	5,040	3,904	3,831	11,196	10,830	55,619	56,763
Difference...........		+376	......	+75	......	−73	......	−366	......	+1144
Rate........	25.9	25.2	46.8	47.3	38.6	37.7	110.8	106.8	14.3	14.1
Difference..........		−0.7	......	+0.5	......	−0.9	......	−4.0	......	−0.2

TABLE SHOWING COMPARATIVE DIARRHEAL DEATHS.

For July, Aug., and Sept.	1912	1913
Deaths under one year................	4381	4119
Diarrheal deaths under one year	1921	1638
Per cent. of all deaths, one year	43.8	39.7

Dr. L. E. LaFetra.—Last year I had the privilege of making two visits to the Floating Hospital and wish to express my admiration of the work done there. All the cases were most thoroughly studied and the staff conference I attended was most interesting. From what has been said of different results of using albumin milk on the cases with gas bacilli and on those with Flexner bacilli, it would seem that a knowledge of the predominating bacteria would be of distinct advantage. Not very often we get a case that does not clear up with the albumin milk and a bacteriological examination would certainly be a help. It would be interesting to know whether Dr. Bowditch has discovered any characteristic feature of the stools, as odor or reaction, that would indicate the kind of infection present.

Dr. Alfred F. Hess.—In his paper Dr. Bowditch did not mention the reaction of the stools. Dr. Kendall originally emphasized the importance of this reaction. He stated that where an acid reaction was present, one should use proteids, and where the reaction was alkaline, a carbohydrate diet should be used. We have found, however, that in spite of an alkaline reaction the children frequently got well with proteid food.

I do not quite understand what is meant by starvation of from five to seven days.

It was stated that sugar had been suggested because sugar had partially disappeared from the blood. Was that a demonstrated fact or a supposition?

It is most important in these cases to give water. This can be given by the drip-method by way of the mouth, as is done by the rectum, using a nipple. A quart can be given in a day by this "mouth-drip"; the method has also the advantage of keeping the baby quiet.

Dr. Henry Heiman.—In reflecting on the work of Dr. Bowditch it seems to us that he has proved his cases to have been infectious diarrheas. Of course we are all acquainted with the Flexner and Shiga bacilli and other bacteria as causing specific infections; but these must be distinguished from the so-called summer diarrheas in which there is no specific infection, in which hundreds of saprophytes may be found, but in which these bacteria play only a secondary rôle. At the Mount Sinai Hospital, in the so-called summer diarrheas, examinations for Shiga bacilli were almost always negative. Out of forty cases examined there was only one in which cocci were found though Gram negative bacilli were always present. It is my belief that most of the cases ordinarily called summer diarrheas are not caused by specific organisms but are mostly due to nutritional disturbances with gastrointestinal symptoms in which the bacteria play only a secondary rôle.

Dr. J. Finley Bell, Englewood, N. J.—The work in the Floating Hospital was most interesting, but it entailed elaborate laboratory apparatus which was not practical in private practice. A simpler method would probably be deduced. In one case of the recurring type in which blood and mucus were present in the stools a diplo-streptococcus was found. Was that a distinct organism or was it a streptococcus infection?

Dr. Roger H. Dennett.—The therapeutic test of determining the variety of diarrhea with which we are dealing by feeding a sugar solution, interested me very much. Here, in New York City, many of us have used just the opposite therapeutic test, that of giving high proteid mixtures as a routine, in all cases except the acute febrile dysenteries, in which gruels seem to be indicated. Except in the last variety of cases, albumin milk and the strong milk and water mixtures seem less liable to do damage and appear more logical on account of Finkelstein's work in which he attributes so many cases of "injury" and "intoxication" to sugars. What about using barley gruels or cooked starches instead of the sugar solution? Do you consider that starches would take the place of sugar solutions? Therapeutically, there must be some place for the time-honored barley gruel which has been used for so many years in the treatment of diarrhea.

Dr. Henry I. Bowditch, Boston.—I did not intend to evade the question of mortality, and while I have not the figures with me I may say that the mortality in 1910 and 1911 was high when the Flexner and Shiga and streptococcus bacilli were predominant. The mortality in the presence of the gas bacilli (1912) was much less (10 to 20 per cent.). The year (1913) it was low until the last month of the summer when it suddenly jumped up, due to a wave of the Flexner bacilli.

Dr. LeFetra spoke of our not using so much albumin milk last year. We were trying to find out what it was that helped these gas bacillus cases. Dr. Hess is right in saying that he considered that acid movements were those in which it was wise to give protein, and when alkaline it is advisable to give sugars; of course the reaction must be taken into consideration with the other symptoms. By starvation I meant starvation as regards food, but water was pressed. It is our practice to give five per cent. lactose or barley water. Dr. Heiman asked about those cases of diarrhea grouped as summer diarrhea. In the treatment of these cases there was no sharp rule of procedure. We do not use albumin milk so much, being rather inclined to the milk mixtures, partly because of the difficulty of preparing the albumin milk. Dr. Dennett asked in egard to the lactose and barley water. Lactose was usually mployed but barley water might be used in the early stages.

One thing remains to be considered, and that is the greater opportunity for us as physicians to get results from groups of cases by cooperative study. We would like this group studied in Philadelphia, New York, Boston, etc., and then we could get together and get something from the results of our observations. One hundred and three cases studied in Boston, the same here and the same in Philadelphia would amount to something and it would be a pleasure to work with such groups and to compare and criticise the work.

TRANSACTIONS OF THE NEW ENGLAND PEDIATRIC SOCIETY.

Meeting of November 8, 1913.

The President, JAMES F. STONE, M. D., *in the Chair.*

BY invitation from the New England Pediatric Society, the Pediatric Section of the New York Academy of Medicine, the New York State Society, the New Jersey Pediatric Society, and the Philadelphia Pediatric Society participated in this meeting.

Clinical Day.—The following hospitals were visited during the day: The Children's Department of the Massachusetts General Hospital, where those who desired could acquaint themselves with the social service work; the Children's Department, Boston Dispensary; New Infants' Hospital in the Harvard Medical School group; the New Children's Hospital in the Harvard Medical School group, and the Massachusetts Babies' Hospital and Directory for Wet-nurses.

A dinner was given at the University Club for the visiting physicians which was followed by a scientific session in John Ware Hall, Boston Medical Library, in the evening.

DR. RALPH VINCENT, London, England, read the following paper:

ON THE BACTERIOLOGICAL DIAGNOSIS AND TREATMENT OF ALIMENTARY DISEASE IN THE INFANT AND CHILD.

Since milk is the natural diet of infancy we are compelled in endeavoring to appraise the actual nature and extent of the pathological condition found in any given case to consider the precise circumstances in which the same or allied processes occur in milk outside the body. It is of importance that we should be able to appreciate the nature of the biochemical processes occurring under normal conditions for we are scarcely in a position to understand the abnormal unless we are acquainted with the normal processes, while we can only estimate the extent and nature of disorder by the measure of its departure from the natural conditions of health.

In the following classification I have grouped the organisms according to the condition determining their growth in and their action upon milk.

1. Bacteria producing lactic acid but not producing gas. This group is represented by the Streptococcus lacticus and the Bacillus lacticus. The Streptococcus lacticus is the typical organism growing in pure milk at 38° C. At a later stage when the acidity has become too great for the streptococcus the Bacillus lacticus appears for this organism is exceptionally tolerant of acid.

2. Bacteria producing lactic acid, carbon-dioxide and alcohol. This group embraces the whole of the colon organisms and includes the Bacillus acidi lactici of Hueppe, the Bacterium acidi lactis aerogenes of Escherich, and the Bacillus coli communis. When pure raw milk is incubated the growth of the organisms belonging to this group is inhibited by the growth of the organisms belonging to the first group. When milk is grossly contaminated colon organisms may gain dominance, and in such case the curdled milk shows evidence of gas production.

3. Bacteria growing in pasteurized milk. The Bacillus putrificus and the Bacillus enteritidis sporogenes are examples of this group and their products are of a highly irritant and dangerous character.

4. Bacteria growing in milk after it has been raised to 100° C., owing to the fact that their spores have not been destroyed. These organisms are found in milk that has been boiled or sterilized, or in condensed milk. This group embraces a large number of organisms, the chief representatives being the Bacillus subtilis, the B. mensentericus, and the B. mesentericus vulgatus. When they develop in the intestines extremely powerful poisons of an alkaloidal nature are created and their absorption produces profound coma and death. These organisms are quite unable to grow in raw milk for their growth is entirely prevented by the acid-forming bacteria. A series of experiments to show the effects of pasteurization at low temperatures showed that the lactic organisms were not destroyed as they finally appeared after long incubation in all cases. In the majority of cases they were so badly injured that they failed to appear at all within twenty-four hours, while the effect of their being unable to develop is shown by the organisms that did actually develop. These included the Bacillus megatherium, B. subtilis, B. mesentericus, and B. enteritidis sporogenes. The employment of such a low temperature is in reality an endeavor to obtain the impossible, that is a method of pasteurization which shall certainly destroy the pathogenic organisms without destroying the lactic organisms. The grave alteration of the milk is shown in the development of the acidity and the time of curdling. Fresh milk curdles at 38° C. within twenty-four hours, generally in eighteen hours, the acidity being from sixty to seventy degrees, while in pasteurized milk the average time of curdling is fifty-five hours and the average acidity at the end of twenty-four hours incubation is twenty degrees which is the acidity of milk at the time of milking. In raw milk the Bacillus enteritidis sporogenes never develops. If a milk be heated at 170° F. it is nearly certain that B. putrificus

will appear on incubation despite the fact that there are numerous other organisms in the milk ready to develop if only the conditions are favorable; if the B. putrificus is capable of developing it will prevent the development of other organisms. Similarly, if the temperature is too high for the B. putrificus to escape destruction then the B. enteritidis sporogenes will probably develop and hold back all other organisms of the subtilis type.

In pure milk the Streptococcus lacticus is the predominant organism. The purer the milk the freer the growth of this streptococcus. At 38° C. it grows characteristically in chains. If the milk is contaminated the growth of the streptococcus is interfered with and colon organisms develop at an early stage with the result that the curd is pitted and if the gas produced is excessive the curd may be brought to the surface of the milk. After seventy-two hours various forms of fungi or moulds begin to develop, their growth being promoted by a considerable amount of acid. The Streptococcus lacticus grows rapidly for twenty-four hours, when the acid produced inhibits its growth; in about forty-eight hours no further development is seen. The development of acidity is due entirely to the action of microorganisms and consequently the temperature at which the milk is kept and the time of exposure to this temperature are the chief factors determining the rate at which acid is produced. The production of acid does not proceed regularly. For the first four hours one degree of acidity above the initial acidity is developed; during the second four hours, two degrees; during the third four hours, four degrees; during the fourth four hours, seventeen degrees; during the fifth four hours, thirty-six degrees; and during the sixth four hours, forty-eight degrees of acidity above the initial acidity are produced.

The contents of the small intestine are normally acid owing to the formation of lactic acid from lactose by lactic acid bacteria. The lactose content continually diminishes as the food products pass through the alimentary canal, till, in the lower part of the colon there is none at all. This explains the difference between the flora of the small and of the large intestine. Were it not for the acid condition putrefactive processes would occur. In the soil the conditions are reversed, for putrefaction is the essential process by means of which dead organic matter is decomposed and rendered available in the vegetable kingdom, so that an acid soil is pathological and we use lime upon it. This statement of the effect of acidity is absolute as regards the obligate proteolytic organisms, but it is relative as regards the colon organisms. The colon bacilli can act in an alkaline medium and also in an acid medium, but the acid must be moderate in amount. With regard to the putrefaction, the production of evil-smelling products is an incident of putrefaction; some organisms give rise to products of most unpleasant odor, others, notably the B. mesentericus vulgatus grow in profusion without creating a change that can be noted by the senses. Thus one of the dangers of pasteurized milk is that it may be loaded with organisms of this character without there being any obvious change to suggest that the milk is not wholesome. If two pails of earth are taken and one is pasteurized while the other is not, and both are planted with beans and kept under exactly the same conditions, it will be found that the beans in the pasteurized soil grow much more luxuriantly than those in the natural soil; this is because of the development of the putrefactive organisms in the pasteurized soil.

Our studies of intestinal bacteriology are hampered by the words "infective" and "pathogenic." These terms are misleading as they tend to conceal the nature of the problem with which we are dealing.

For examination of the intestinal dejecta the Zeiss microscope is the most workmanlike and efficient instrument. The condenser should be the aplanatic of N. A. 1.4 and the chief objective should be the 2 mm. apochromatic of N. A. 1.4. A nose-piece should not be employed. The most convenient eye-piece is the compensating ocular No. 6. The methods used involve in some respects a considerable departure from those generally employed in biological research. In making the examination the plate method is not used. By means of a platinum loop a film is made on a glass slide. This film is dried and fixed over the Bunsen flame, care being taken not to overheat it. The two routine staining methods are the Loeffler's blue and a special method of staining which I have devised in which the Gram method is used with Loeffler's blue as a differential stain. The great advantage of this method is that it differentiates all the lactic group from the colon group. The normal dejection contains numerous lactic acid bacilli, some colon bacilli, and possibly a few diplococci. The confinement of the streptococcus in the normal condition to the small intestine has been amply demonstrated. Both Kendall and Finkelstein have drawn attention to the great tendency of the lactic acid bacilli to be found in certain cases in almost pure culture. In other cases masses of diplococci or streptococci are seen and these may be combined with lactic bacilli. In still other cases we may not infrequently find a mixed specimen, lactic organisms and colon bacilli, together with the oidium lactis. All of these are acid conditions and quite exclude a colon toxemia. This is a valuable indication, giving definite information as to what should be done in the way of treatment, and in particular what should not be done. Fresh milk will completely rid the intestines of oidium lactis and similar fungi in about twenty-four hours. A cooked milk containing an excessive amount of sugar favors the development of these organisms. The colon organisms are facultative fermentative organisms, but are eminently proteolytic when the conditions permit this. In the normal condition of the alimentary tract they must act fermentatively for the acid contents of the small intestine prohibit the proteolytic phase, while diminishing acidity favors the fermentative action in the colon for they are sensitive to acid and cannot act in the fully acid condition characteristic of the active growth of the Streptococcus lacticus. Thus the colon organism can deal with the remnants of lactose that may pass the ileum producing not only lactic acid but a small amount of gas.

According to my observations the administration of starches markedly encourages the growth of the colon organisms.

Some considerable practical experience is necessary to enable the observer readily to pick up the leading indications presented by the specimens but it will be found that the majority of cases are fairly straightforward, while in others there are some special factors that must be taken into account, and as these are brought into line they generally prove to be extremely valuable in elucidating the special features of the particular case.

Among workers at the Infants' Hospital there is no doubt that by means of the bacteriological examination we have arrived at a means of diagnosis which in respect of accuracy and precision is far superior to any other means at our disposal. Our diagnosis and treatment are fundamentally dependent on the reports from the research laboratory and I would like to cite instances demonstrating this statement. Upon the question of the relationship of the proteolytic streptococcus to alimentary disease I have not been able to arrive at any definite conclusion. In the large series of cases examined I have not been able to attribute any serious conditions to the presence of proteolytic streptococci. As a rule, the children in whom they were present were suffering from a mild toxemia.

My investigations in regard to the biochemical changes occurring in raw milk taught me that in all such inquiries the usual periods of bacteriological incubation were much too long. We systematically investigated the conditions as found in the milk cultures at 38° C. after four hours' and after eight hours' incubation, only prolonging the investigation when such a course seemed to be indicated.

By observing the nature of the organisms, the order of their appearance, and their relative dominance, we are able to obtain a real conception of the processes occurring in the alimentary canal. Moreover, as the case proceeds we are in a position accurately to appraise the changing conditions, and I have selected a number of typical reports in order to demonstrate the methods by means of which the diagnosis is made. In England involvement of the intestinal mucous membrane in diarrheal disease in infants is distinctly rare. This statement is based on the examination of many thousands of consecutive cases. In America it would appear that the mucous membrane is more frequently involved, judging by the clinical reports in regard to the presence of blood. Cases of acute colitis caused by the B. enteritidis sporogenes are not uncommon, but I have never seen a case in a patient under twelve months of age.

In dealing with an intestinal condition due to the dominance of the acid-forming organism, the first line of treatment is the exclusion of all diet calculated to assist the lactic organisms. Raw milk must be forbidden. Cooked milk with the lactose reduced to a minimum is indicated. In such case a reasonable amount of fat may be given and a considerable amount of protein in the form of caseinogen. If this is given in the shape of milk the lactose may still be too much and we therefore may employ precipitated casein. In these cases chalk may be useful and opium in minute amounts. Thus some very old-fashioned remedies are found to have their justification in the bacteriological condition of the intestine. A further preliminary treatment is albumin water made with normal saline to which a few teaspoonfuls of diluted meat extract are added, while small doses of brandy are given at intervals. Very gradually a milk diet is introduced. The treatment is constantly checked by the examination of the dejections. In this class of cases we have exaggerated the value of purgation. Active stopping of the diarrhea is not unsound treatment; it gives the irritated intestine rest by stopping the excessive acid production.

The treatment of the condition arising from dominance of the colon bacilli depends on the age of the child. In infants under six months of age, particularly those under four months, it is a mistake to undertake too active treatment. It is better to adopt measures favoring the gradual development of the lactic organisms by dietetic management than by the administration of pure cultures. If the case is obstinate and does not respond to raw milk, cultures may be administered.

Cases of acute intestinal toxemia caused by the action of proteolytic organisms, in my experience, never occur unless the infant had been fed on cooked food or there has been in other respects some marked departure from rational diet. The results are nearly always fatal. In cases of bronchopneumonia dejections should be systematically examined and upon the appearance of colon dominance, cultures of Streptococcus lacticus may be immediately administered.

According to my observation, children fed on boiled milk are more liable to contract tuberculosis and the reason for this is the chronic toxemia resulting from the proteolytic action of the colon bacilli.

Treatment by cultures of antagonistic organisms is not, as a rule, indicated in young infants; in older infants and in children I have obtained most gratifying results by bacteriological treatment as the cases reported illustrate. The pure cultures are necessarily prepared in sterilized milk but they are never given in cooked milk. Milk in its natural condition is the most favorable medium for the lactic organism. The bacteriological examination should be made by the physician; he should know everything at first hand about his case. The cultures must be prepared under his direction and control. Some varieties of B. lacticus grow slowly at first and some produce larger amounts of acid than others and these things must be taken into consideration. The patient must be kept under observation and the dejecta subjected to systematic examination. Bacterial treatment had better be altogether neglected than carried out in a superficial or perfunctory manner.

DISCUSSION.

Dr. E. S. Dow, Boston, Mass.—The bacterial side of diarrheal conditions has always been interesting to me. Dr. Vincent has touched on the main point at issue. There are two groups of men at work on the problems presented by the diarrheal diseases of infancy; the one on chemical lines studying fat, carbohydrate, and protein intolerance, and this group is inclined to omit the importance of bacteriological conditions; on the other side, the bacteriologists who are working at this problem are inclined to neglect chemical lines. These two lines of study should be brought into harmony. I have always felt convinced that bacteriology would furnish a sound basis for the treatment of these conditions. We have long realized that there are the two conditions, overacid and putrefactive, but what has been needed is a reliable method of finding out which condition is present. The work presented should help us in arriving at a rapid and reliable means of differentiating these two conditions, putrefactive and overacid growth.

INVESTIGATIONS IN VULVOVAGINITIS BY MEANS OF THE FEMALE URETHROSCOPE.

Dr. John F. Sinclair, Philadelphia, Pa.—Since the discovery of the gonococcus by Neisser, in 1879, the great majority of medical men have slowly but surely come to regard vulvovaginitis as a serious infectious disease, not usually venereal in origin, but in the vast majority of instances due to the presence of the Neisserian organism.

The concensus of opinion at the present time seems to group vaginal discharges under two heads; that is, simple vaginal catarrh, and specific vaginitis due to the gonococcus. Its widespread prevalence and its terrible infectivity are perhaps less clearly appreciated. It was primarily with the view of improving our methods of prophylaxis that the present study was undertaken. The characteristic tendency of the disease toward periods of latency is so misleading that new and improved methods of vaginal examinations were eagerly sought. In January last, Leopold and Rubin reported their experience with the electric-lighted female urethroscope in searching for evidences of vaginitis in children. This appeared to be an improvement on the use by Koplik in 1893 of Skene's urethral speculum for this purpose and we determined to test its efficiency as a diagnostic aid.

During the present year eighty-three infants, admitted to the Babies' Hospital of Philadelphia, have been examined with the female urethroscope. All were under three years of age. Upon arrival at the hospital a vulvar smear was made in every case, and the bacteriological findings noted. Only the negative cases were admitted to the general wards, all positive and suspicious cases being isolated for further study. In taking these smears we have used the dry swab, the moist swab, and the platinum loop. The last has given the best results, the moist swab being somewhat less satisfactory, while the dry swabs have proved to be much inferior. We have also used a 1–5000 solution of bichloride of mercury, injecting it deep into the vaginal vault with a pipet provided with a small rubber bulb and then recovering the solution and subjecting it to careful bacteriological examination. This method has not proved as serviceable in our hands as we expected, nor have we been able to secure as good results as those reported by Van Gieson. However, this was probably due to our technic as Hamill and Kolmer speak highly of this method.

The complement fixation test was employed in ten cases and the results of this are detailed as shown in the chart. Dr. Kolmer conducted the laboratory work incident to making the fixation tests. These are so far as we know the first series of complement fixation tests made on infants which are accompanied by notes of endoscopic examinations of the cervix and vaginal mucosa. That 50 per cent. showed a positive reaction to the test is also of interest as former investigators, notably Schwartz and McNeill, were unable to report any positive reactions. Several cases which had had some discharge but seemed to be well on the way to recovery gave positive reactions to the complement fixation test. The source of infection was sought for, and an effort was made to fix upon the date of onset, when this was possible. Complications and sequelæ were noted when present. It is regretted that it was found impossible to have cultural tests made.

Of the eighty-three cases examined, sixteen, or 19 per cent., were found to be infected with the gonococcus at the time of admission to the Hospital, or to present highly suspicious evidence of such infection. Seven cases which were negative upon admission subsequently developed vaginitis of specific origin. Five of these had been in the Hospital from five weeks to thirteen months and had shown no evidence of vulvovaginitis on repeated examinations. They were sent to a convalescent home in the country between June 3 and June 26, and no vaginal discharge was noted among the infants until July 20, when one of the babies was reported to have gonorrheal ophthalmia, and examination disclosed also a specific vulvovaginitis. From this time to July 29, four additional cases of Neisserian infection were discovered.

Of the remaining two cases one was reported as negative bacteriologically and clinically on August 11, but positive two days later. The other baby was negative when admitted on July 30 and did not present positive signs of vulvovaginitis until August 13.

Nine cases admirably illustrated the well-recognized tendency to latency in this disease and suggest the thought that one of the great questions in regard to proper prophylaxis has to do with early recognition of the infectious agent in these latent cases. Upon the day of admission five cases out of the series of twenty-three were negative according to the report of the vulvar smear, but proved to be positive or highly suspicious upon subsequent endoscopic examination and study of the vaginal smear. In other words, 21.74 per cent. of the total number of cases to be found in the first two groups would have escaped detection without the use of the electric-lighted female urethroscope. Only seven babies, or 30 per cent. of the cases in groups I and II, showed any visible signs of discharge upon admission.

The source of infection was a most difficult question to determine and in none of their cases could it be definitely settled. The date of onset could only be accurately recorded in those cases beginning *de novo* in the convalescent home or in the hospital.

The following complications were noted, each condition occurring but once: ophthalmia; an exanthematous condition about the vulva, buttocks and thighs; and proctitis.

The treatment consisted of irrigations of permanganate of potassium 1–8000, and local applications of argyrol in 20 per cent. solution. When the discharge became scanty a solution of hydrochloric acid 1–10,000 was substituted for the solution of potassium permanganate. Irrigations with both of the solutions were discontinued with the disappearance of the discharge and were thereafter only employed on days when a discharge was again present.

To be effective, prophylaxis must begin with a campaign of education in the homes where infants are born and raised, as well as in all manner of institutions which have to do with the various phases of child welfare. Day nurseries, infant and orphan asylums, hospitals, shelters, public baths, recreation centers, and even our school houses are prolific sources of infection, and will continue to be until adequate medical supervision is exercised and individual cases are isolated until free from the specific infection.

In all institutions where children are received, every child should be examined upon admission for clinical and bacteriological evidences of gonococcal infection and promptly removed or isolated if the findings are positive. Proper isolation in institutions demands the employment of special nurses, who shall have no other duties, or in any way come in contact with babies or children in other parts of the institution. The lay helpers should be free from gonorrheal infection and this should be determined by bacteriological examination and the complement fixation test. Systematic examinations of all inmates of such institutions should be made with thoroughness at convenient intervals that latent cases may be early detected and isolated before becoming centers of infection.

In the case of public bath houses, recreation centers, and schools, efficient supervision should be exercised by properly qualified trained nurses so that every suspicious case may be promptly excluded and referred to a physician for treatment.

Boards of Health should be empowered by law to make gonorrheal infections reportable and to exercise their authority along lines similar to those which they now employ in dealing with tuberculosis.

Medical attendants, especially gynecologists, and genitourinary surgeons, should inform their patients clearly as to the nature of the disease and the danger of communicating it to innocent babes and children, and should give minute instructions as to how they may safeguard those about them. Special clinics for the treatment of gonorrheal vulvovaginitis should be established in all large cities as they have been in Boston and New York.

DISCUSSION.

Dr. Richard M. Smith, Boston.—We have been working on this subject trying to work out a method of treatment, but what I wish to call special attention to is the value of the complement fixation test. We have had several instances where children have been treated for vulvovaginitis and kept out of school when they were found later to have a mixed infection. The complement fixation test would settle such cases as these.

ACTIVE IMMUNIZATION IN DIPHTHERIA BY TOXIN-ANTITOXIN MIXTURE.

Dr. William H. Park, New York.—There have been attempts to use the diphtheria toxin itself by a number of investigators, notably the Russian and German. They have tried to immunize themselves but naturally have been very cautious in the amounts of toxin used. They have not presumed to practice their attempts at immunization on others. One of these men tried the method of applying the toxin on cotton pledgets in the nostrils, leaving the pledgets in the nostrils for about an hour daily for ten days. At the end of twenty days he was producing from five to ten units of antitoxin. According to reports there were no symptoms following this method outside of slight local effects. Many of our methods of immunization and treatment have been discovered by accident. The use of antitoxin was an accident. The use of the toxin-antitoxin was the result of an attempt to be economical in the use of guinea-pigs. After giving the guinea-pigs toxin we gave them more antitoxin than was necessary in order to use them over again and soon found that they had a certain degree of immunity. This was noted as far back as 1895, when we gave horses diphtheria toxin and then more antitoxin by one-half than would neutralize it. In Boston Dr. Smith found that his pigs not only had immunity but that the young of these immunized pigs had a certain degree of immunity.

In our immunity experiments we have been using horse serum which is an alien antitoxin and is eliminated in about four weeks, but if we can develop antitoxin in the human system the immunity should remain. A year ago Behring injected a number of children with toxin-antitoxin mixture and actually immunized them against diphtheria and we have carried out the same line of investigation. The charts presented show some of the results of animal experimentation. In making this study we found ourselves confronted with two dangers; the danger of using too large an amount of toxin, when the animal speedily died, or with a lesser amount of the toxin became paralyzed; or, on the other hand, the danger of giving too large an amount of antitoxin when no immunity would result. Calling that amount of toxin 100 per cent. which would produce active symptoms of diphtheria and death, we have given smaller amounts of toxin, 90 per cent., 80 per cent., 70 per cent., and so on down to 40 per cent. and have observed the results. We found that 85 per cent. allowed some of the animals to live but caused paralysis. As the amount of toxin was decreased the number of deaths decreased and the paralysis diminished until from 60 to 70 per cent. of the fatal dose of toxin was administered, when it was found that at this point the greatest degree of immunity was secured together with the greatest degree of safety. This immunity persisted almost unchanged for six months and was but slightly diminished at the end of seven months. Different proportions of antitoxin were also used. The proportion of antitoxin that seemed to give the greatest immunity was an amount a little greater than was necessary to neutralize the dose of toxin. In a series of experiments on horses it was found that 0.66 of a unit of toxin to one unit of antitoxin produced the largest amount of antitoxin in the blood and the greatest degree of immunity.

In our experiments on children in New York we found that about four-fifths of the children receiving the toxin-antitoxin injections, after ten days, developed from one-half to two units of diphtheria antitoxin for each cubic centimeter of blood. This persisted for a number of months in gradually lessening amounts. In one series of fifteen cases these were five that developed no antitoxin and two of these developed diphtheria when they were given antitoxin with no serious results and made rapid recoveries from the disease.

One of the children in this series had one-tenth of a unit of antitoxin normally and in fourteen days this child developed four units of antitoxin. The children who had antitoxin normally in the blood developed a greater amount of antitoxin than those who had none normally. None of the children with antitoxin normally in the blood developed diphtheria.

In the scarlet fever wards of 433 children receiving 1000 units of antitoxin as a prophylactic dose on admission to the hospital, twenty developed diphtheria: all were given another dose of antitoxin and in no instance had there been any evidence of anaphylaxis, while in every case the diphtheria was controlled. In scarlet fever Behring found that active immunity broke down in several instances.

There have been 120,000 cases of diphtheria treated in New York City since 1893. At that time the mortality from diphtheria was 1.30 per 1000 population, while in 1912 it was 0.21. The morbidity from diphtheria in 1898 was 3.42, in 1903 it was 4.85; in 1904 it was 4.65; in 1912 it had fallen to 3.61. Thus it might be seen that with the use of antitoxin, the mortality rate has been greatly decreased but the morbidity curve has decreased little if any at all. This shows the need of some procedure that will lessen the incidence of diphtheria and the question arises as to whether active immunity will give enough benefit to be worth the trouble since active immunization confers immunity on about three-fourths or two-thirds of the children receiving the injections for a period of about a year. It is possible that there is a distinct need for active immunization in cities where diphtheria is endemic. For outbreaks in institutions and in families passive immunization is undoubtedly the better method in the present state of our knowledge as regards active immunity.

DISCUSSION.

DR. E. H. PLACE, Boston, Mass.—In regard to the production of active immunity, Dr. Smith has suggested the idea of endeavoring to produce it but no one had had the courage to attempt it in the human being. As to the incidence of diphtheria, it is not evident that there had been any reduction in this respect. Although the morbidity curve has been slightly lower it should be remembered that culture diagnosis has come into play and has exerted some influence on the morbidity curve. All seek some means of bringing about active immunity; for this would seem under present conditions of living to be the only means of controlling and limiting the spread of the disease.

We have made some studies here using the bacilli and then testing for amboceptors. The findings seemed to indicate that although a patient may cease to be a carrier the bacilli may still exist in the blood.

DR. WILLIAM H. PARK, New York.—I may add that the results of our work in active immunity has been such that we do not feel at all discouraged in attempting further investigations. We are planning to use this on many thousands of cases and to follow them up for several years.

THE POSITION OF THE STOMACH IN CHILDREN.

DR. JAMES WARREN SEVER, Boston, Mass.—During the past year or more, I have examined a large number of stomachs of children of various ages and physiques by means of the bismuth meal and the *x*-ray in the effort to determine the average location of the stomach in the erect position of the individual. The criticism that may be made is that the data have been gathered from the so-called hospital class, which is supposed to be represented by individuals rather below par than above it, and also that these children would not have come to the hospital unless there was something rather definite the matter with them. Many of the children examined, however, did not represent abnormal or unusual types of the so-called normal child. They were no more round shouldered than the usual school child.

The subject is one that cannot be represented adequately by mere statistics so I shall offer a general statement of the conclusions arrived at through the study of these data.

In the literature on this subject we find much that will have to be discounted, if not altogether discarded, in the future as we become more cognizant of the subject, and I believe that so far we have been led to lay undue stress on the condition of so-called visceral ptosis, congenital or otherwise, in children. I cannot find that the normal position of the child's stomach has ever been determined. Holt states that if the lower border of the stomach comes nearly to the umbilicus the stomach is dilated and that if it is below the umbilicus it is much dilated. Practically all text-books and monographs speak of the normal position of the stomach as being well above the umbilicus, the lower border being in the region of the second lumbar vertebra. Butler found in the examination of 155 children that 40 per cent. had the lower border of the stomach when distended by gas within 1/2 inch of the umbilicus. In several older children who had bismuth examinations the picture showed the lower border of the organ below the umbilicus but these cases showed also the typical enteroptotic habit and dislocated kidneys. It is my belief that displaced stomachs are exceptional in early childhood, up to the age of twelve or fourteen years. Richard R. Smith found by dilating the stomachs of fifty-seven children that the lower pole was well up in the abdomen. He believes with Holznecht and Hulst that the lower border of the stomach should be in the region of the level of the pylorus, that is about the second lumbar vertebra. Goldthwait and Brown make the same statement but add that the position of the stomach may be greatly modified by the posture which may be assumed by the individual. Chase states that it used to be generally agreed that, in the absence of dilatation, gastroptosis was present in adults whenever the lower border of the stomach was found at or near the umbilicus. Yet in a study of thirty-nine normal adult males he found in sixteen cases the lower border at or below the unbilicus. Hertz and Morton found that in seventeen healthy young men in the upright position the greater curvature was invariably below the umbilicus. Coffey also states that the normal stomach in the erect position comes just below the umbilicus. This sketch of the literature shows the diversity of opinions as to the normal location of the stomach and how indefinite this location is.

It is a commonly stated fact that about one person in five is born with a congenitally defective support of the colon and stomach, which may lead to a greater or lesser degree of visceral ptosis. I am going to show that in children at least the position of the stomach is, so far as I have observed in over ninety cases, a much lower one normally than has hitherto been suspected, and also that we must revise our ideas as to the normal position of the stomach in children, regardless of their posture, a factor which I believe has been greatly overestimated.

In my series of cases there were eighty-three examined, sixty girls and twenty-three boys. These children varied in age from four to eighteen years, the average age being ten or eleven years. The weight, state of nutrition and general body development were also observed, and also the attitude and the size, the shape and capacity of the thorax, together with the shape of the costal angle. I was unable in any case to palpate the kidneys, regardless of the relaxation of the abdominal walls or the degree of ptosis of the stomach. No attempt was made to outline the stomach by palpation or by inflation with gas as it was felt that this was unsatisfactory.

In making the *x*-ray examination the children were given from 2 1/2 to 3 ounces of bismuth subcarbonate stirred in a glass of water. Immediately after this the child was put in front of the *x*-ray tube and about 18 inches away from it, standing in the usual erect attitude, with the back to the tube, which was on a line with the umbilicus so as to prevent any possible distortion. The plate was pressed lightly against the abdomen and short expostures were made. In some instances a picture was made of the child lying on its face in order to get a picture of the stomach in that position. The crests of the ilia were used for purposes of comparison. A number of the children were frail, with poor musculature, little body fat, and were under size and weight for their ages, while others were well above the average. The averages of size and weight were well up to Dr. Holt's averages. Of the girls forty-seven were well developed and nourished, and thirteen were poorly developed and nourished; of the boys twenty-one were well developed and nourished and two were poorly developed and nourished. As far as I was able to observe, general conditions and body weight, with or without much adipose tissue, had very little to do with the position of the stomach. Many children who were very well nourished had quite as much ptosis as others who had no signs of fat about them; in fact there could be no rule established in regard to this point.

The shape, capacity, and development of the thorax are supposed to play an important part in the position of the abdominal organs and so a special study was made in these cases of the size, shape, and capacity of the thorax. In this series the capacity of the thorax was measured relatively by the chest expansion which showed a relatively good average. For the sixty girls it was 1.64 inches; for twenty-one boys it was 1.86 and average for the eighty-one cases of 1.70 inches. In some of the cases a long, flat, narrow thorax was noted, but there was quite apt to be a stomach relatively high in these cases as in others with a normal thorax. A number of these cases with a contracted thorax showed a normal or relatively great chest capacity as compared with those of the normal type, and no relation could be established in regard to the shape or capacity of the thorax with the degree of ptosis present or to be expected. The costal angle in these cases was generally normal or broad. In a study of the literature it has been noted that great stress is laid upon the so-called index of Bescher and Lenhoff, the determination of which is supposed to give one an adequate idea as to the relative capacity of the upper abdomen. This index is found by dividing the jugulo-pubic distance by the waist measure, taken just around the lower ribs, and multiplying by 100. This gives a purely relative index, and the higher the index the less is the capacity of the upper abdomen supposed to be. This has been done in nearly every case in this series, and has proved to be rather a failure as a means of estimating the probable position of the stomach. Indices of over 80 were supposed to represent a condition of relative incapacity of the upper abdomen, whereas indices under 80 indicate a normal capacity of this area. The average index of fifty girls was 80, of twenty-three boys 75, and of seventy-three cases 78, or normal. The average and individual indices for the cases showed that very little reliance was to be placed on these data as a guide to the presence or absence of visceral ptosis. Cases with the highest indices showed no other evidences which could suggest ptosis, and others with low or moderate indices showed all degrees of ptosis. There could be no definite lines or relations established between the index and the shape, development, or capacity of the thorax, or shape of the costal angle.

As to the position of the stomach itself in these cases, it was noted that, taking the crests of the ilia as landmarks, twenty-five showed the lower border of the stomach opposite the fourth lumbar vertebra, nine showed it at the level of the crests, and in forty-nine instances the lower border was well below the crests of the ileum, often in the pelvis, often as much as 3 or 4 inches below the crests. These findings were of great significance. To find such a uniformly low position of the stomach in such a large series of cases could mean nothing except that that was where the stomach belonged. I believe such a low position is normal, and that in the future the second lumbar vertebra will have to be discarded as the normal landmark of the lower border of the stomach. In the study of the *x*-ray plates I was much impressed by the size and shape of the stomachs as well as by their low positions. The shape varied considerably, the most persistent type being that of the sink-drain variety, and, while they were nearly all large organs, a few were more horizontal and near what is generally considered the normal size.

There were very few stomachs presenting the so-called normal cow's horn shape, and none of these were in the position usually regarded as normal. Many of the stomachs were seen in the middle line, but many were also seen to the left, apparently resting well within the iliac fossa. The investigation, therefore, showed that in these eighty-three cases of generally well-developed average children, the average position of the stomach was much lower than had been previously suspected and that to find a stomach at or well below the crest of the iluem was not at all unusual. But one of these children had symptoms referable to the digestive tract. We must change our ideas as to the shape and size of the child's stomach; it is generally large and either horizontal or of the sink-drain type. The ideal so-called cow's horn stomach is rare. A low stomach in a child does not mean pathological ptosis

DISCUSSION.

DR. MAYNARD LADD, Boston.—All of our work has been done on infants under nine months of age and done with reference to gastric motility rather than to the position of the stomach, but I believe that the position of the stomach in these younger children is higher than we have thought it. In twenty-five cases which I have examined there were none in which the lower border of the stomach reached anywhere near the crest of the ileum.

DR. ABRAHAM JACOBI, New York.—Dr. Ladd's remarks are in order. In infancy the position and shape of the stomach changes rapidly. In the new-born the stomach is in nearly a vertical position and by the end of one month it is in an oblique position, the lower border being in front of the tenth dorsal vertebra. It then gradually descends. I wish that Dr. Sever would take this subject up and observe the position of the stomach at the different months and years of infancy and childhood. Again, the position of the infant's stomach changes according to the character of the food. The fundus in particular showed marked differences in the artificially fed infant from what was found in the breast-fed infant. I have looked up the literature and find that the first demonstration of the localization of the stomach in infancy was made in 1825, and at that time the stomach was pictured as in a vertical position at birth and soon afterward.

Dr. Arthur R. Kimpton, Boston.—I have recently had occasion to do two autopsies, one on a child three weeks and the other on a child four days old. The first child had been normally born, and had gained 8 ounces the first week. It then began vomiting and a diagnosis of pyloric stenosis was made. The condition was neglected, not by the attending physician, but by the parents. A palpable tumor could be definitely made out, so the pyloric stenosis was not spasmodic. The stomach was in the oblique position higher up than the text-books show. I have the illustration with me which is interesting as showing a picture of pyloric stenosis. This child's stomach was normal in size and the tumor looked like a newgrowth rather than a hyperplasia.

The second case was not one of pyloric stenosis, but of congenital absence of the large intestine. An artificial anus had been made. In this subject the stomach was extremely high and in an oblique position. The large intestine was about the thickness of a lead pencil and the obstruction occurred about an inch from the ileocecal valve. There was no meconium but the cord-like intestine was filled with a putty-like substance. In such cases one should look for the obstruction close to the cecum rather than in the large intestine.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Management of Breast Feeding.—Lucy Naish (*Lancet*, June 14, 1913) says that few mothers understand that the baby's cry during the first two or three days, before the flow of milk has become established, is not a cry of hunger but a natural process for the full expansion of the lungs; consequently they are worked up into a state of feverish anxiety. A vicious circle thus results, the nervous condition affecting the milk supply unfavorably. Many babies will struggle and scream for long periods before they will nurse effectively. The aversion is sometimes distinctly unilateral. The baby should be laid across the mother's body and a pillow placed under the arm that supports the child's head. The finger placed in the baby's mouth acts as a stimulus to sucking, and by rapidly withdrawing it and substituting the nipple the opposition of the child may with patience be overcome. The after-pains brought on by the baby sucking during the first two or three days are sometimes intense. An assurance that this pain is really beneficial in helping the organs to regain their normal size again in a great comfort and removes one more hindrance to lactation. Some people have scoffed at the careful arrangement of hours for feeding.

There can be little doubt that it is best to let the baby have its meal at what is evidently the optimum time of secretory activity. The milk flows from the breast very quickly during the first two or three minutes; it comes out in several strong jets at this time, while during the latter part of the sucking period the flow is very slow. This vigorous flow may irritate the back of the child's throat and cause it to choke, so that it begins to scream and refuses to suck. The crying of the baby is often taken as an indication of deficient supply of milk. The simplest way of investigating this is to give the child a test feed by weighing it before and after a meal on sensitive scales. The writer carried out a series of test feeds on one baby during the first month of life, testing almost every meal during this period, and was unable to find any relationship between the amount taken and the amount of crying between the feeds. Suckling a child is associated with distinctly nervous phenomena. Insanity has a tendency to appear at such times, and the lesser grades of insanity merge into what is a very usual condition, hyperexcitability. A headache which comes on with greater intensity when the mother tries to go to sleep, and which effectually prevents sleep,is quite common. It is often easily controlled by phenacetin and caffeine. Rest is most essential. Bromides at night will enable the mother to get to sleep again quickly if she is aroused to feed the baby. There are certain periods when the milk tends to fail and when it is particularly easy for weaning to take place. These danger times are the ninth day, third and sixth weeks, and the beginning of the third and fourth months. At these periods exercise, fresh air, sleep, etc., should be insisted upon.

Breast Feeding.—"Let the child on the breast drink according to its appetite" has been the teaching of Variot. D. H. D. Cran (*Lancet*, June 14, 1913) says that serious accidents so commonly attributed to overfeeding by the breast must be very exceptional. If the child has taken a little too much milk there is a simple regurgitation, which occurs at that moment after the meal when the stomach contracts and expels the air swallowed with the milk. The stomach of the baby is not a rigid receptacle; its musculature is extensible and its glandular mechanism is quite able to chymify a fairly large quantity of the mother's milk. When a young mother is healthy and has a regular secretion of good milk, and when her baby is likewise normal and drinks well, it is quite useless to weigh before and after each meal. In these circumstances it is sufficient to weigh the child once or twice a week. On the other hand, the methodic use of the weighing machine is indicated as soon as a child on the breast ceases to increase in weight. This will usually show that the secretion of milk is diminishing. The milk of the mother must be administered as an aliment and not measured as a medicine.

Treatment of Diphtheria Bacillus Carriers with Bouillon Cultures of Staphylococcus Pyogenes Aureus.—J. D. Rolleston (*Brit. Jour. Child. Dis.*, 1913, x, 298) has treated ten chronic diphtheria bacillus carriers by spraying and swabbing the throat or nose with a bouillon culture of *Staphylococcus pyogenes aureus*. In six faucial cases the findings became negative within two to seven days after starting the treatment. In the two nasal cases the treatment was ineffective. In all but two cases a mild form of sore throat was produced, but no complication ensued.

Case Simulating Meningitis; Symptoms Caused by Escape of Thread-worms through Perforated Appendix.—This is reported by R. N. H. A. Whitelocke (*Brit. Jour. Child. Dis.*, 1913, x, 296). A girl of five and a half years was admitted with the diagnosis of tuberculous meningitis, an enlarged cervical gland having been removed a year before. She had been ill for thirty-six hours, had a temperature of 102.4° F. and pulse of 112, with marked convergent strabismus, contraction of both pupils, some photophobia, restlessness and occasional screaming. She was very constipated. Any attempt at drinking brought on immediate vomiting. She had urinary incontinence. Two days later she began to pick at the bedclothes, to throw herself about in bed in a restless, irregular manner, and to wet herself more frequently. At this time it was noticed that she kept her right lower limb fully flexed and drawn up to the abdomen. There was increased rigidity in the right rectus muscle. She called out when even gentle pressure was brought to bear over the cecum. Operation showed about a dozen dead thread-worms enclosed by the omentum. The appendix was found to possess a pin-point perforation through which living thread-worms were wriggling. After its removal the nervous symptoms soon disappeared and recovery was prompt and complete.

Treatment of Infantile Diarrhea by Saline Injections.—The interest aroused by Quinton's claims in favor of the treatment of infantile diarrhea by subcutaneous injections of his marine plasma (diluted sea-water) led the Department of Public Health in Egypt to make a special trial of this method in view of the great mortality from this cause in the country. H. B. Day (*Practitioner*, 1913, xci, 58) gives an account of the results obtained in 1912 in 444 cases available for statistical returns. The following solutions were used: (1) Quinton's marine plasma, sea-water, collected in sterilized vessels at a sufficient depth and distance from land to ensure purity, diluted with sterilized distilled water to make an isotonic solution; (2) Sea-water collected off Alexandria and diluted in the same way, three parts to seven parts of filtered distilled water, and sterilized. (3) Ringer's solution. Alexandrian sea-water with medicines gave 81.25 per cent. of recoveries; Alexandrian sea-water alone, 81.5 per cent.; Quinton's sea-water, 87.5 per cent.; Ringer's solution, 85 per cent.; medicine only, 95.1 per cent. Making allowance for the fact that the more severe cases of diarrhea were more common in the early summer months, these results show that saline injections alone, without drugs, are capable of curing most cases of infantile diarrhea. Quinton's marine plasma has no definite superiority over artificial saline of the same strength. Such hypertonic solutions are preferable to weaker (.75 per cent. or less). The administration of medicine is preferable to injections of saline as a routine treatment of infantile diarrhea. Disregard of dietary instructions is the commonest cause of failure of out-patient treatment. Injections are valuable in proportion as the loss of fluid—by vomiting and diarrhea—exceeds the intake. They should be given before actual symptoms of collapse arise. The indications for saline injections, which should supplement and not supersede the medicinal treatment of infantile diarrhea, are persistent vomiting of food or of medicine, falling temperature with aggravation of other signs, exhaustion shown by sinking of the eyes and loss of elasticity of the skin.

Treatment of Vertebral Paralyses and Spasm.—Peter Bode (*Münch med. Woch.*, July 1, 1913) states that paralysis and spasm of varying degrees results from pressure in cases of tuberculous disease of the spine, although from 50 to 62 per cent. are curable, only one in two of these cases recovers. To cure this spasm replacement of the vertebræ is made by plaster casts, and by placing the child in apparatus that produces a lordosis, with pads increased gradually in thickness as the child can bear them. Operations have also been suggested, laminectomy and removal of posterior portions of the vertebræ so as to relieve the pressure on the cord, and enable abscesses to be drained and tuberculous granulations to be taken away. Also nerves have been cut so as to interrupt the reflex arc and thus lessen the spasm. The bone-cutting operations have proven very fatal; out of 104 children operated on, by one surgeon, only fifteen were cured, and forty-three died. Treatment by apparatus entails long rest in bed in the horizontal position, which is very irksome to the child and bad for his general health. The author has treated eight children by a new method, in which the child is kept in a vertical position instead of a horizontal one. He makes a plaster cast of the child from neck to feet, which serves as a model for apparatus which is made for legs and thighs, with a leather corset for the trunk. The apparatus is so constructed that the foot is at right angles with the leg, and when the child is placed in a vertical position the soles of the feet are on the ground. Elastic straps are so arranged that they counteract the spasm, gradually stretching the stiffened muscles. The corset is so arranged that the upper portion of the trunk cannot drop forward, and the thigh pieces are immovably fixed to it. The child is placed in a "go-frame," and at first is like a doll suspended in the frame immovable. He is encouraged to try to propel the frame about the room by means of the thigh muscles, which at first have small motion. Soon they begin to strengthen, and an energetic massage and movement cure is given twice daily without the frame. The elastic traction on the spastic muscles gradually stretches them and they begin to regain power. When the child is able to walk in the frame, or with crutches, the lower portion of the apparatus is dispensed with. The cure is often very slow, but is sure, all the eight cases having been completely relieved by it. When the foot is able to be flexed, extended, pronated, and supinated a flat-foot apparatus is worn until a complete cure is obtained. The factors in the cure are the improved circulation in the spinal cord due to the upright position, and the better drainage obtained for the abscess. There is also a lessening of impulses sent to the brain by the spastic muscles, and the central nervous organ gets more rest.

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